SR 100

Intersection Analysis for SR 100 at Seminole Woods Parkway/Town Center Boulevard

January 2015

Prepared for:

River to Sea Transportation Planning Organization (R2CTPO)
2570 W. International Speedway Blvd., Suite 100
Daytona Beach, FL 32114-8145

Prepared by:
GMB Engineers & Planners, Inc.
2602 E. Livingston Street,
Orlando, FL – 32803

KATHRYN L. LEE LICENSE NO. 62420 STATE OF FLORIDA PROFESSIONAL ENGINEER

1/9/15

Professional Engineer: Kathryn L. Lee PLE#62420 Jan 09, 2015

Intersection Analysis
For
SR 100 at Seminole Woods Parkway and Town Center Boulevard

Task 2014-2-1
Work Order #1

FLAGLER COUNTY

Prepared for:

R2CTPO

Prepared by:

GMB ENGINEERS & PLANNERS, INC.
Orlando, FL

January 2015

EXECUTIVE SUMMARY

This report presents the results of an Intersection Analysis completed for SR 100 at Seminole Woods Parkway/Town Center Boulevard, which is located in the City of Palm Coast in Flagler County, Florida. This report was prompted by an application by the City of Palm Coast to construct a right turn lane from northbound Seminole Woods Parkway to SR 100.

Throughout the course of this analysis, it became apparent that it would be infeasible to add a separate northbound right turn lane due to the physical constraints found at the intersection and the high costs associated with their modification. An alternative to construct a separate left turn lane in the median, convert the existing left turn lane to a through lane and the existing combined through/right turn lane to an exclusive right turn lane was developed to improve the safety and operation of the intersection, and was analyzed as part of this report.

Based upon the crash and speed analyses, qualitative assessment, field observations, intersection analysis, B/C Analysis and engineering judgment, the following modifications are recommended to improve the safety and operation of the intersection:

1: Construct a separate left turn lane on Seminole Woods Parkway and convert the existing left turn lane to a through lane and the existing combined through/right turn lane to a right turn only lane. Because of the physical constraints found at the intersection and the high costs associated with their modification, the addition of a separate right turn lane is not considered feasible at this location. In lieu of a separate right turn lane, it is recommended that a separate left turn lane be constructed in the median, and that the existing left turn lane be converted to a through lane and the existing combined through/right turn lane be converted to an exclusive right turn lane. The installation of a separate northbound left turn lane will have a beneficial effect to the operation of the northbound movement as well as to the intersection as a whole, particularly during the a.m. peak hour when the delay and LOS will decrease from 58.8 sec./LOS E to 34.4 sec./LOS C. The recommended queue length is 140' and the deceleration length is based on a design speed of 45 mph since vehicles are presumably slowing due to the presence

of rumble strips on the approach, the impending signal ahead and a posted speed limit of 25 mph on the opposite side of SR 100. This modification can be implemented at an approximate cost of $37,450.38 and yields a B/C ratio of 8.09, which indicates that the anticipated benefits outweigh the estimated costs for the proposed modification.

2: Install 2'-4' white skip pavement markings for the NB and SB left turn movements and the NB right turn movement. During the QA it was observed that the EB and WB left turn movements had skip pavement whereas the NB and SB left turn movements did not. In addition, a minor pattern of sideswipe crashes between the southbound left turn movement and the northbound right turn movement was noted in the Crash Analysis. Installation of the skip pavement markings will provide guidance to vehicles turning left from Town Center Boulevard and Seminole Woods Parkway, and right from Seminole Woods Parkway, and may reduce or eliminate the sideswipe conflicts occurring between the SB left and the NB right turn movements.

3: Install retro-reflective back plates on all signal heads. The existing eastbound and westbound signal heads are equipped with standard back plates; however the signal heads on the northbound and southbound approaches are not. In an effort to mitigate the number of rear end crashes by increasing the visibility of the signal heads, it is recommended that the existing back plates be replaced with retro-reflective back plates, and that retro-reflective back plates be installed on the northbound and southbound signal heads as well. The existing yellow and all red clearance intervals were also evaluated in order to determine if they could be adjusted in order to help reduce rear end crashes; however they were found to be compliant with current TEM criteria.

4: Install 4-section signal heads over the northbound and southbound left turn lanes. Studies show that the 4-section signal heads improve the safety of an intersection by providing a more direct, and less confusing message to motorists, and are more efficient by providing more options for controlling traffic.

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INTRODUCTION

GMB Engineers & Planners, Inc. was retained to perform an Intersection Analysis for SR 100 at the intersection of Seminole Woods Parkway/Town Center Boulevard, which is located in the City of Palm Coast in Flagler County, Florida, as illustrated in Figure 1. This report was prompted by an application by the City of Palm Coast to construct a right turn lane from northbound Seminole Woods Parkway to SR 100. The purpose of the analysis is: 1) to identify cost feasible intersection improvements that may be appropriate to reduce intersection congestion and delay and 2) to eliminate northbound (Seminole Woods Parkway) to eastbound (SR 100) vehicular turning movements from the unpaved shoulder and right-of-way. The analysis will particularly consider the benefits and feasibility of adding a dedicated northbound right turn lane on Seminole Woods Parkway.

The analysis methods used in completing this study are consistent with the Manual on Uniform Traffic Control Devices (MUTCD), the Manual on Uniform Traffic Studies (MUTS), the Traffic Engineering Manual (TEM) and engineering judgment. The remainder of this report documents existing conditions, vehicle and pedestrian counts, qualitative assessments, crash analyses, intersection analysis, B/C Analysis and recommendations.

DATE CREATED: 12/10/2014

PROJECT NUMBER: 13-094.01

GMB ENGINEERS & PLANNERS, INC.
2602 East Livingston Street
Orlando, Florida 32803

SR 100 at Seminole Woods Parkway
Intersection Analysis

FIGURE 1
Location Diagram

EXISTING CONDITIONS

Field Inventory

The intersection of SR 100 and Seminole Woods Parkway/Town Center Boulevard is located in the City of Palm Coast in Flagler County, Florida. The Existing Condition Diagram, Figure 2, depicts the existing conditions at the study intersection including the general roadway geometry, pavement markings, land use, and intersection traffic control. In addition, photographs of the existing conditions around the intersection are provided at the end of this section. The conditions stated in this report reflect conditions as observed on the date of the qualitative assessment.

The intersection of SR 100 and Seminole Woods Parkway/Town Center Boulevard is a "plus" shaped intersection with SR 100 running east-west and Seminole Woods Parkway/Town Center Boulevard running northwest to southeast. Seminole Woods Parkway forms the south leg of the intersection and Town Center Boulevard forms the north leg of the intersection. The intersection is under signal control.

SR 100, Seminole Woods Parkway and Town Center Boulevard are all 4-lane divided rural design type roadways. At the intersection, SR 100 and Town Center Boulevard is widened to accommodate a left turn lane on each approach. Seminole Woods Parkway remains 2-lanes up to the intersection, where the inside lane becomes a left turn only lane. There are no separate right turn lanes on any of the approaches. The posted speed limits are 45 mph along SR 100, 55 mph along Seminole Woods Parkway and 25 mph along Town Center Boulevard. Rumble strips are installed in advance of the intersection on Seminole Woods Parkway.

The traffic signal is a mast arm design with painted mast arms located in all four quadrants of the intersection. There are supplemental near-side pedestal mounted traffic signals located on the shoulder and in the median for the westbound approach. There are backplates on the east-west facing overhead signal heads. Red-light cameras have been installed on both SR 100 approaches. The signal phasing provides protected left turns from SR 100 and

protected/permissive left turns from Seminole Woods Parkway and Town Center Boulevard. There are signalized special emphasis pedestrian crosswalks across the north and east legs of the intersection. Sidewalks run along the north side of SR 100, the east side of Seminole Woods Parkway and the west side of town Center Boulevard. Street lighting is present at the intersection on three of the mast arm poles and along both sides of Town Center Boulevard. There is no street lighting along SR 100 or along Seminole Woods Parkway.

The land use within the vicinity of the intersection consists of a Florida Power and Light (FPL) substation in the northeast quadrant, a hotel and restaurant in the northwest quadrant and vacant land in the southeast and southwest quadrants. Florida Hospital is immediately adjacent to the FPL property. SR 100 is a major arterial connecting the City of Bunnell to I-95 and the beaches. Town Center Boulevard is largely undeveloped; however it provides back access to the hospital and the FPL yard, and will provide access to future commercial and or residential development. Seminole Woods Parkway is also largely undeveloped immediately adjacent to the road; however it is a collector for numerous single family subdivisions along the corridor.

SR 100 at Seminole Woods Parkway/Town Center Boulevard

Exhibit 1: Looking west towards the intersection on WB SR 100

Exhibit 2: Looking east away from the intersection on WB SR 100

SR 100 at Seminole Woods Parkway/Town Center Boulevard

Exhibit 3: Looking east towards the intersection on EB SR 100

Exhibit 4: Looking west away from the intersection on EB SR 100

SR 100 at Seminole Woods Parkway/Town Center Boulevard

Exhibit 5: Looking north towards the intersection on Seminole Woods Parkway

Exhibit 6: Looking south away from the intersection on Seminole Woods Parkway

SR 100 at Seminole Woods Parkway/Town Center Boulevard

Exhibit 7: Looking south towards the intersection on Town Center Boulevard

Exhibit 8: Looking north towards the intersection on Town Center Boulevard

SR 100 at Seminole Woods Parkway/Town Center Boulevard

Exhibit 9: Tracking on shoulder on Seminole Woods Parkway

Exhibit 10: Red light camera on SR 100

SR 100 at Seminole Woods Parkway/Town Center Boulevard

Exhibit 11: Right shoulder and sidewalk on Seminole Woods Parkway

Exhibit 12: Median on Seminole Woods Parkway

N

0 10 40
Feet

TOWN CENTER

TOWN CENTER BLVD.

TOWN CENTER

POWER STATION

ONLY

STOP

DIVIDED HIGHWAY

ONE WAY

ONE WAY

SR 100

ONE WAY

STOP HERE ON RED

ONE WAY

ONE WAY

ADOPT-A-HIGHWAY
BLUE KNIGHTS CHAPTER XXII

SR 100

SEMINOLE WOODS PKWY.

VACANT

VACANT

LEGEND

- Controller Cabinet
- Light Pole
- Concrete Swale
- Trees and Bushes
- Wall
- Water Meter
- Delineator Metal Pole
- Delineator Tubular
- Concrete Power Pole
- Wood Power Pole
- Traffic Signal pole
- Fire Hydrant
- Sign (1 Post)
- Sign (2 Posts)
- Street Name Sign
- Pedestrian Signal Head
- Guard Rail
- Signal Pullbox
- Fence
- Overhead Sign
- Inlet
- Signal Head
- Sanitary Sewer
- Ditch Bottom Inlet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GMB Engineers & Planners, Inc.
2602 E. Livingston St
Orlando, FL 32803
Phone: 407-898-5424 Fax: 407-898-5425

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	FLAGLER	

CONDITION DIAGRAM
SR 100 AT
SEMINOLE WOODS PKWY.

FIGURE NO. 2

$USER$ $DATE$ $TIME$ $FILE$

Traffic Volume Data

24-hour traffic counts were collected on Tuesday, November 18, 2014, representing a typical commuter weekday. The counts recorded that, on SR 100, 12,634 vehicles approached the study intersection in the eastbound direction and 13,561 vehicles approached the study intersection in the westbound direction. 3,903 vehicles approached the study intersection in the northbound direction from Seminole Woods Parkway and 2,788 vehicles approached the study intersection in the southbound direction from Town Center Boulevard. These volumes clearly indicate that SR 100 is the mainline and Seminole Woods Parkway and Town Center Boulevard are the side streets.

The 24-hour traffic counts were supplemented with 8-hour intersection turning movement counts. The turning movement counts were collected between 7:30 a.m. –11:30 a.m., 12:00 p.m. – 4:00 p.m. and 4:30 p.m. – 6:30 p.m. These hours represent the highest eight hours obtained from the approach counts. From this data, the a.m., mid-day and p.m. peak traffic hours were found to occur from 8:00 a.m. to 9:00 a.m., 3:00 p.m. to 4:00 p.m. and 4:30 p.m. to 5:30 p.m., respectively. The overall peak hour for the intersection was found to occur during the p.m. peak hour.

The volumes on SR 100 reveal that the weekday traffic flow pattern is not directional in nature and that the distribution of traffic on SR 100 is fairly evenly distributed, with the westbound volumes slightly higher than the eastbound volumes during all eight hours of the count. On the side streets, the northbound flow of traffic from Seminole Woods Parkway is consistently higher than that of the southbound flow of traffic from Town Center Parkway during all eight hours of the count. There were four pedestrians and four bicyclists observed crossing at the intersection during the 8-hour turning movement counts. The following table summarizes the distribution of turning movements through the study intersection:

Table 1: Weekday Turning Movement Percentages (All Vehicles)				
Movement	**Northbound**	**Southbound**	**Eastbound**	**Westbound**
Left-turn/U-turn	41.4%	38.1%	10.2	12.8%
Through	21.3%	25.5%	79.1%	80.2%
Right-turn	37.3%	36.4%	10.7%	7.0%

The 8-hour turning movement counts, 24-hour approach counts and pedestrian/bicycle counts are provided in greater detail in the Appendix.

Crash Data:

Crash reports compiled by Florida Signal Four Analytics were provided by R2CTPO. Based on this data, there were 35 crashes reported within the influence area of the intersection during the latest 36 month period covering July 7, 2011 to July 7, 2014. The crashes consisted of 26 rear end crashes, 3 left turn crashes, 3 sideswipes, 1 right turn crash, 1 pedestrian crash and 1 crash where a vehicle ran off the road. The crashes caused 15 injuries, and total property damage amounted to approximately $167,300.00. There were no fatalities. 9 of the crashes occurred at night and the remaining 26 crashes occurred either during the day or at dusk. Pavement conditions were wet for 9 of the crashes.

Based on this information, it is apparent that rear end crashes account for the majority of the crashes at the intersection, with most of them occurring on SR 100 rather than on the side streets. Rear end crashes are inherent with signalized intersections, and there were no geometric constraints such as vertical or horizontal curves or trees that would obstruct the visibility of the traffic signal. A minor pattern of sideswipe crashes between the southbound left turn movement and the northbound right turn movement is also noted.

There was one pedestrian related crash at the intersection. The crash was non-fatal and occurred as a pedestrian was traveling southbound at night across the west leg of SR 100. At the time of this crash there were no pedestrian crosswalks or signals installed at the intersection; therefore it is presumed that this crash was an isolated incident and has been remediated with the installation of crosswalks and pedestrian signals.

A Crash Summary and Crash Diagram are provided in the following pages.

TABLE 2

CRASH SUMMARY

MAJOR ROUTE: SR 100 **COUNTY:** FLAGLER

SECTION: INTERSECTION OF SR 100 & SEMINOLE WOODS PKWY. **CITY:** PALM COAST

STUDY PERIOD: July 7, 2011 - July 7, 2014 **ENGINEER:**

CRASH REF. NO.	HSMV NO.	MILE POINT	DATE	DAY	TIME	DOB	AGE	Vehicle Types		ALCOHOL/DRUGS	CRASH TYPE	FATAL	INJURY	PROPERTY DAMAGE	LIGHTING CONDITION	WEATHER	PAVEMENT CONDITIONS	CONTRIBUTING CAUSE
								1st	2nd									
1	82054746		9/26/2011	Monday	3:57 P.M	8/25/1985	26	Pick-up Truck	Vehicle	NO	REAR END	0	0	$28,000	DAY	CLOUDY	WET	CARELESS DRIVING
2	82880079		7/5/2012	Thursday	9:20 P.M	7/15/1968	44	Vehicle	Vehicle	NO	LEFT TURN	0	1	$7,000	DARK (SL)	CLEAR	DRY	FTYRW
3	82347847		7/23/2012	Monday	6:52 P.M	6/2/1990	22	Vehicle	Vehicle	NO	REAR END	0	0	$2,000	DAY	CLOUDY	DRY	DRIVER DISTRACTION
4	82347893		8/16/2012	Thursday	8:24 A.M	10/18/1978	34	Pick-up Truck	Vehicle	NO	REAR END	0	1	$100	DAY	CLEAR	DRY	DRIVER DISTRACTION
5	82892750		10/26/2012	Friday	4:36 P.M	4/17/1933	80	Passenger Van	Vehicle	NO	REAR END	0	0	$10,000	DAY	RAIN	WET	CARELESS DRIVING
6	82348173		12/9/2012	Sunday	12:29 A.M	9/26/1995	17	Vehicle	N/A	NO	HIT TREE	0	0	$5,000	DARK (NO SL)	FOG	DRY	DRIVER DISTRACTION
7	82892767		12/21/2012	Friday	5:03 P.M	6/20/1939	74	Vehicle	Vehicle	NO	REAR END	0	2	$30,000	DAY	CLEAR	DRY	CARELESS DRIVING
8	82348277		1/22/2013	Tuesday	2:08 P.M	12/3/1989	23	Vehicle	Vehicle	NO	REAR END	0	0	$3,000	DAY	CLEAR	DRY	CARELESS DRIVING
9	82348320		2/7/2013	Thursday	4:04 P.M	4/15/1973	40	Vehicle	Passenger Van	NO	REAR END	0	1	$2,200	DAY	RAIN	WET	FOLLOWED TOO CLOSELY
10	82348336		2/13/2013	Wednesday	7:37 P.M	12/15/1963	49	Vehicle	Vehicle	NO	REAR END	0	0	$2,500	DUSK	RAIN	WET	FOLLOWED TOO CLOSELY
11	82348339		2/14/2013	Thursday	9:31 P.M	3/15/1964	49	Vehicle	Vehicle	NO	REAR END	0	0	$3,000	DARK (NO SL)	RAIN	WET	CARELESS DRIVING
12	82348346		2/18/2013	Monday	9:30 A.M	7/29/1974	39	Vehicle	Vehicle	NO	REAR END	0	0	$300	DAY	CLEAR	DRY	DRIVER DISTRACTION
13	82348394		3/9/2013	Saturday	8:27 P.M	2/25/1978	35	Vehicle	Vehicle	NO	REAR END	0	1	$3,000	DARK (NO SL)	CLEAR	DRY	FOLLOWED TOO CLOSELY
14	82348398		3/16/2013	Saturday	10:13 A.M	8/18/1931	82	Vehicle	Vehicle	NO	REAR END	0	0	$5,000	DAY	CLEAR	DRY	CARELESS DRIVING
15	82348409		3/19/2013	Tuesday	6:19 P.M	10/22/1977	35	Pick-up Truck	Vehicle	NO	REAR END	0	0	$3,500	DAY	CLEAR	DRY	DRIVER DISTRACTION
16	82352086		4/5/2013	Friday	11:30 A.M	7/1/1958	55	Vehicle	Vehicle	NO	REAR END	0	1	$3,500	DAY	CLEAR	DRY	FOLLOWED TOO CLOSELY
17	82352121		6/25/2013	Tuesday	9:08 A.M	8/19/1968	45	Pick-up Truck	Vehicle	NO	REAR END	0	0	$1,250	DAY	CLEAR	DRY	CARELESS DRIVING
18	84018218		6/29/2013	Saturday	6:16 P.M	7/19/1986	27	Vehicle	Vehicle	NO	REAR END	0	2	$3,000	DAY	CLEAR	WET	NO IMPROPER DRIVING
19	83278990		8/11/2013	Sunday	3:30 A.M	9/30/1971	42	Vehicle	Pedestrian	NO	HIT PEDESTRIAN	0	1	$4,000	DARK (NO SL)	CLEAR	DRY	NO IMPROPER DRIVING
20	84018297		8/29/2013	Thursday	2:25 P.M	7/30/1955	58	Vehicle	Vehicle	NO	SIDE SWIPE	0	0	$1,000	DAY	CLEAR	DRY	IMPROPER TURN
21	83278993		9/24/2013	Tuesday	9:18 P.M	9/20/1975	38	Vehicle	Pick-up Truck	NO	RIGHT TURN	0	0	$3,000	DARK (NO SL)	RAIN	WET	CARELESS DRIVING
22	84018381		11/1/2013	Friday	9:59 P.M	11/22/1970	43	Vehicle	Passenger Van	NO	REAR END	0	0	$250	DARK (NO SL)	CLEAR	DRY	FOLLOWED TOO CLOSELY
23	84018385		11/5/2013	Tuesday	2:19 P.M	6/2/1962	51	Vehicle	Pick-up Truck	NO	REAR END	0	1	$3,500	DAY	RAIN	WET	CARELESS DRIVING
24	84019396		12/10/2013	Tuesday	2:45 P.M	3/9/1968	46	Vehicle	Vehicle	NO	REAR END	0	0	$200	DAY	CLEAR	DRY	FOLLOWED TOO CLOSELY
25	84576011		12/27/2013	Friday	12:31 P.M	5/22/1995	19	Vehicle	Pick-up Truck	NO	REAR END	0	0	$250	DAY	CLEAR	DRY	FOLLOWED TOO CLOSELY
26	840185217		2/13/2014	Thursday	5:40 P.M	3/1/1995	19	Vehicle	Vehicle	NO	REAR END	0	1	$10,000	DAY	CLEAR	DRY	CARELESS DRIVING
27	84018552		3/4/2014	Tuesday	12:53 P.M	2/18/1972	42	Vehicle	Vehicle	NO	REAR END	0	0	$4,000	DAY	CLEAR	DRY	FOLLOWED TOO CLOSELY
28	84018576		3/21/2014	Friday	4:20 P.M	1/18/1989	25	Pick-up Truck	Vehicle	NO	REAR END	0	2	$4,000	DAY	CLEAR	DRY	FOLLOWED TOO CLOSELY
29	84018597		4/4/2014	Friday	7:08 P.M	4/21/1984	30	Vehicle	Vehicle	NO	REAR END	0	0	$750	DARK (NO SL)	CLEAR	DRY	CARELESS DRIVING
30	84576866		4/25/2014	Friday	3:36 P.M	12/8/1976	37	Vehicle	MOTORCYCLE	NO	REAR END	0	0	$200	DAY	CLEAR	DRY	DRIVER DISTRACTION
31	84577106		5/28/2014	Wednesday	8:15 A.M	11/12/1936	78	Vehicle	Vehicle	NO	LEFT TURN	0	0	$11,000	DAY	CLEAR	DRY	FTYRW
32	84577196		6/9/2014	Monday	12:09 P.M	12/29/1995	18	Vehicle	Vehicle	NO	SIDE SWIPE	0	0	$4,000	DAY	CLEAR	DRY	FTYRW
33	84018631		6/10/2014	Tuesday	10:32 P.M	4/10/1952	62	Vehicle	Vehicle	NO	LEFT TURN	0	1	$4,000	DARK (NO SL)	CLEAR	DRY	FTYRW
34	84577252		6/14/2014	Saturday	5:33 P.M	5/9/1986	28	Vehicle	Vehicle	NO	REAR END	0	0	$2,500	DAY	RAIN	WET	CARELESS DRIVING
35	84577491		7/7/2014	Monday	10:46 A.M	3/13/1924	90	Vehicle	Vehicle	NO	SIDE SWIPE	0	0	$2,300	DAY	CLEAR	DRY	FTYRW
Total												0	15	$167,300				

TOTAL CRASHES	FATAL CRASHES	INJURY CRASHES	TOTAL INJURIES	PROPERTY DAMAGE	PED /BIKE /MOTORCYCLE	ONE VEHICLE	LIGHTING CONDITION						ROADWAY CONDITIONS	
							DAYLIGHT		DARK (SL)	DARK (NO SL)	DUSK	DAWN	WET	DRY
35	0	15	15	35	2	2	25		1	8	1	0	9	26
	0%	43%	NA	100%	6%	6%	71%		3%	23%	3%	0%	26%	74%

CRASH TYPE														
ANGLE	LEFT TURN	RIGHT TURN	REAR END	SIDE SWIPE	HEAD ON									
0	3	1	26	3	0									
0%	9%	3%	74%	9%	0%									

CRASH TYPE														
BACKED INTO	PARKED CAR	COLL. W/ MV ON ROAD	PEDESTRIAN	BIKE	BIKE IN BIKE LANE	MOTORCYCLE/MOPED	TRAIN	BUS	ANIMAL	HIT SIGN/ SIGN POST	HIT GUARDRAIL	HIT UTILITY POLE	HIT FENCE	HIT CONCRETE BARRIER WALL
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

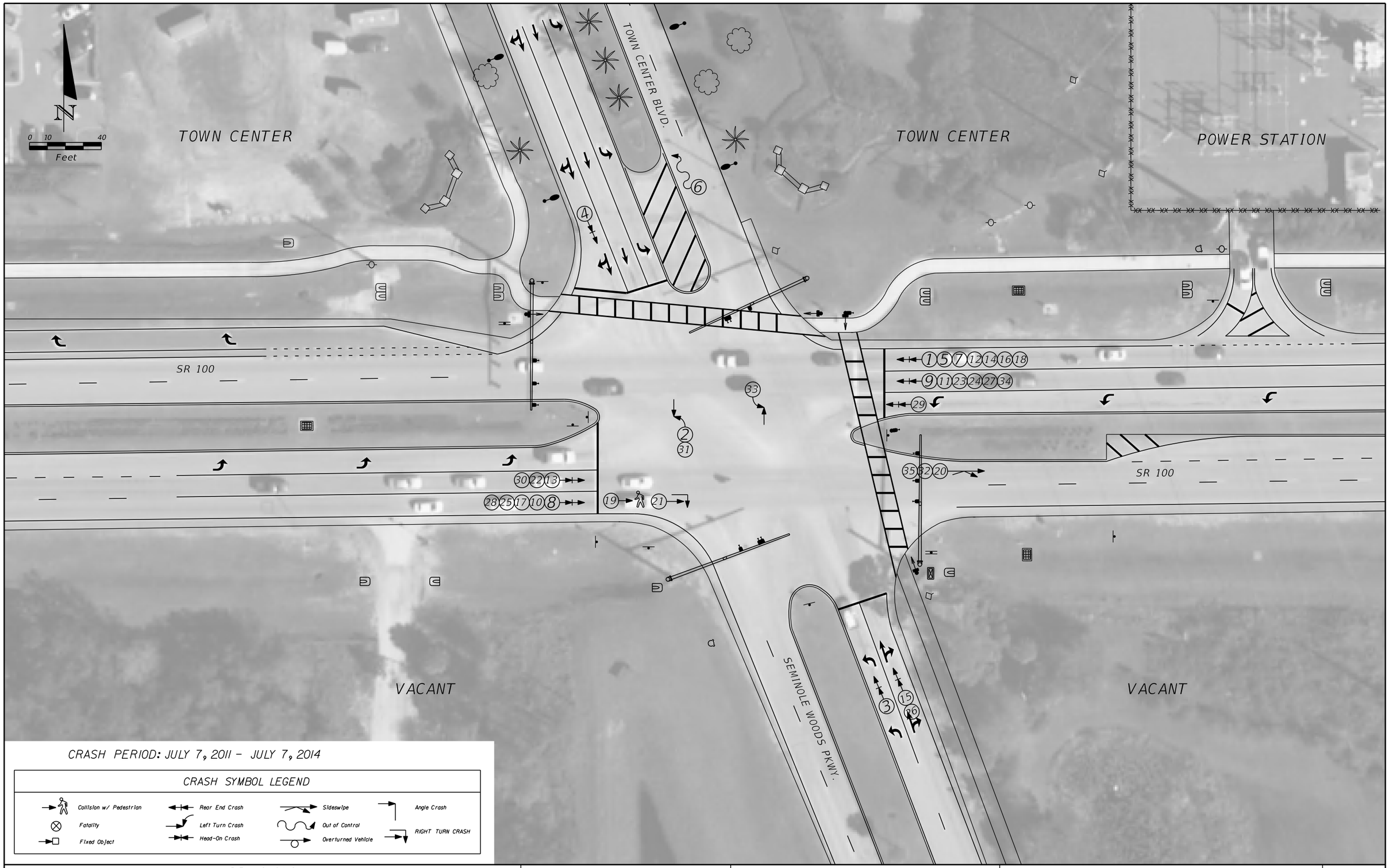
CRASH TYPE														
HIT BR/PIER/ ABUTT	HIT TREE/SHRUB	HIT CONST. SIGN/ BARR./ BR./ PIER	TRAFFIC GATE	CRASH ATTENUATOR	FIXED OBJECT ABOVE ROAD									
0	1	0	0	0	0									
0%	3%	0%	0%	0%	0%									

CRASH TYPE														
OTHER FIXED OBJECT	MOVEABLE OBJECT	RAN INTO DITCH/ CULVERT	RAN OFF ROAD INTO WATER	OVERTURNED	OCCUPANT FELL FROM VEHICLE	TRAC/TRAIL JACKKNIFED	FIRE		EXPLOSION	DOWNHILL RUNAWAY	CARGO LOSS OR SHIFT	SEPARATION OF UNITS	MEDIAN CROSSOVER	ALL OTHER
0	0	0	0	0	0	0	0		0	0	0	0	0	0
0%	0%	0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%

CONTRIBUTING CAUSE														
NO IMPROPER DRIVING	CARELESS DRIVING	FTYRW	IMPROPER BACKING	IMPROPER LANE CHANGE	IMPROPER TURN									
2	12	5	0	0	1									
6%	34%	14%	0%	0%	3%									

CONTRIBUTING CAUSE														
ALCOHOL-UNDER INFLUENCE	DRUGS- UNDER INFLUENCE	FOLLOWED TOO CLOSELY	DISREGARDED TRAFFIC SIGNAL	EXCEEDED SAFE SPEED LIMIT	DISREGARDED STOP SIGN	FAILED TO MAINTAIN EQUIPMENT	IMPROPER PASSING		DROVE LEFT OF CENTER	EXCEEDED STATED SAFE SPEED LIMIT	OBSTRUCTING TRAFFIC	IMPROPER LOAD	DISREGARDED OTHER TRAFFIC CONTROL	DRIVING WRONG SIDE/ WAY
0	0	9	0	0	0	0	0		0	0	0	0	0	0
0%	0%	26%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%

CONTRIBUTING CAUSE			
FLEEING POLICE	VEHICLE MODIFIED	DRIVER DISTRACTION	ALL OTHER
0	0	6	0
0%	0%	17%	0%



CRASH PERIOD: JULY 7, 2011 - JULY 7, 2014

CRASH SYMBOL LEGEND

Collision w/ Pedestrian	Rear End Crash	Sideswipe	Angle Crash
Fatality	Left Turn Crash	Out of Control	RIGHT TURN CRASH
Fixed Object	Head-On Crash	Overturned Vehicle	

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

GMB Engineers & Planners, Inc.
2602 E. Livingston St
Orlando, FL 32803
Phone: 407-898-5424 Fax: 407-898-5425

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	FLAGLER	

$USER$ $DATE$ $TIME$ $FILE$

CRASH DIAGRAM
SR 100 AT
SEMINOLE WOODS PKWY.

FIGURE NO. 3

QUALITATIVE ASSESSMENT

A qualitative assessment (QA) was conducted in the field in order to evaluate the existing operating conditions occurring on a typical weekday, and to identify areas where improvements would be potentially beneficial to the overall safety and efficiency of the location. A registered professional engineer performed the QA from 4:30 p.m. – 5:30 p.m. during the evening peak hour period.

1. During the QA, the intersection, as a whole, appeared to operate smoothly and with minimal delay. The volume of traffic observed on SR 100 was significantly higher than the volumes observed on Seminole Woods Parkway and Town Center Boulevard; confirming SR 100 as the mainline roadway. The flow of traffic on SR 100 was heavier in the westbound direction than in the eastbound direction. Vehicles on SR 100 arrived at the intersection in platoons. This is likely caused by the close proximity of traffic signals at the adjacent intersections at Memorial Medical Parkway, which is approximately 1,400' to the east, and Bulldog Drive, which is approximately 4,000' to the west. Queues on westbound SR 100 backed up significantly; however all queued vehicles were able to clear the intersection in a single traffic signal cycle. Queues on eastbound SR 100, Seminole Woods Parkway and Town Center Boulevard were not as significant, and were easily able to clear the intersection within a single traffic signal cycle.

2. The intersection is, in general, straight and flat, so the sight distance to the signal is not impeded and was not observed to present any operational or safety concerns. There is a horizontal curve on the southbound approach; however with a posted speed limit of 25 mph (design speed limit of 35 mph), and a corresponding stopping sight distance of 250', there is more than adequate distance to perceive the traffic signal and safely stop, if necessary.

3. There are red-light cameras on the eastbound and westbound SR 100 approaches. Warning of the cameras are provided by traffic signal "photo enforced" signs located approximately 400' in advance of the stop bars. This spacing meets and exceeds the

recommended spacing of 175' provided in the MUTCD, and provides adequate warning of a potential stop situation ahead. No flashes were observed during the QA.

4. There are no separate right turn lanes on any of the intersection approaches. There are tracking marks on the shoulders of the eastbound, westbound and northbound approaches which bear evidence that vehicles are traveling on the shoulders to get around stopped through traffic to proceed with their right turn. The maneuver was observed several times during the QA, but particularly on the northbound approach.

5. There are crosswalks with pedestrian signals across Town Center Parkway and the east leg of SR 100. The crosswalks are marked with special emphasis pavement markings, which are appropriate for a crossing at a signalized intersection. The walk times provided appeared adequate for pedestrians to cross at a normal pace and within the allotted time. Pedestrian and bicycle traffic was light at the intersection during the QA. Only one pedestrian and one bicyclist were observed. The pedestrian utilized the crosswalk and pedestrian signals whereas the bicyclist rode in the SR 100 median and crossed south to Seminole Woods Parkway when there was a sufficient gap in traffic. Based on the crash data, there was one pedestrian crash at the intersection. The crash was non-fatal and occurred as a pedestrian was traveling southbound at night across the west leg of SR 100. At the time of this crash there were no pedestrian crosswalks or signals installed at the intersection; therefore it is presumed that this crash was an isolated incident and has been remediated with the installation of crosswalks and pedestrian signals.

6. The lane configuration on the northbound approach of Seminole Woods Boulevard consists of 2 through lanes. At the intersection, the inside lane becomes a left turn only lane and the outside lane becomes a combined through/right turn lane. Based on the MUTCD, transitioning the use of the lane from a through lane to a left turn only lane requires notification in the form of a "Left Lane Must Turn Left" (R3-7) sign in the median at the intersection and at approximately 325' in advance of the intersection to provide motorists with enough time to safely change lanes, if necessary. "ONLY" pavement marking messages with left turn arrows are also required to supplement the signs. The signs and

"ONLY" pavement messages are missing from this approach, so that no warning of the lane use change is given until motorists are right at the intersection, creating the potential for rear-end and/or side-swipe crashes to occur.

7. The eastbound and westbound left turn movements have 2'-4' white skip pavement markings to guide motorists through the intersection; however there are no skip pavement markings to guide the northbound and southbound left turn movements.

8. Rumble strips have been installed in advance of the intersection on Seminole Woods Parkway, presumably to slow traffic and alert motorists of the impending intersection.

NORTHBOUND RIGHT TURN LANE FEASIBILITY ANALYSIS

Background

An application was received from the City of Palm coast to perform a feasibility study to install a northbound right turn lane on Seminole Woods Parkway at SR 100. The purpose of the lane is to reduce delay for vehicles turning right onto SR 100, to eliminate vehicles from using the unpaved shoulder or right-of-way and to reduce congestion. The City contends that there is a need for this project since Seminole Woods Parkway is the main arterial to and from the Seminole Woods neighborhood, which currently consists of approximately 1,850 developed lots and 2,950 undeveloped lots. Seminole Woods Parkway is also a connector between US 1 and SR 100, and it is anticipated that traffic volumes on it will increase as development in the Seminole Woods neighborhood and the surrounding vicinity continues to increase.

Methodology

The methodology for determining the feasibility of installing a northbound right turn lane includes performing an assessment of the proposed site, a comparison of before and after operating conditions at the intersection utilizing traffic operation analysis software, and preparing a Benefit/Cost (B/C) analysis for any proposed improvements.

Assessment of Proposed Site

Seminole Woods Parkway is a four-lane divided roadway. At its intersection with SR 100, the outside northbound through lane becomes a combined through/right turn lane and the inside northbound through lane becomes an exclusive left turn lane. From comparison of existing conditions observed in the field with Google imagery dated January 15, 2014, it is apparent that an 8’ sidewalk was recently completed along the east side of Seminole Woods Parkway, and that crosswalks and ramps were installed across the east and north legs of the intersection. In order to install a separate right turn lane at this location, the sidewalk would need to be relocated back from the roadway. Based on the locations of the utility poles and the mowing maintenance limits, it appears that the sidewalk is already at the right-of-way line, and that additional right-of-way would be required in order to install a separate right turn lane and still maintain a sidewalk along Seminole Woods Parkway. Since Seminole Woods Parkway and SR

100 utilize open swales to carry water away from the intersection, the swales would need to be re-worked in order to accommodate the additional lane. The southeast quadrant of the intersection is also the home for the traffic signal controller and power service meter, a mast arm strain pole, a concrete utility pole and a pedestrian signal pedestal. Due to their proximity to the road, the installation of a separate right turn lane would likely cause these elements to need relocation as well.

Because of the physical constraints found at the intersection and the high costs associated with their modification, rather than constructing a separate right turn lane, it is recommended that a separate left turn lane be constructed in the median, and that the existing left turn lane be converted to a through lane and the existing combined through/right turn lane be converted to an exclusive right turn lane. The operational analysis and the B/C analysis are based on this proposed geometry.

Operational Analysis

An intersection operation analysis was performed for before and after conditions. The before conditions assume that there is no change in intersection geometry and signal timings, whereas, the after conditions assume that the lane configuration on Seminole Woods Parkway will be modified to include a separate left turn lane, a single through lane and a separate right turn lane with virtually unlimited storage since it is formed from the outside northbound through lane. The existing operating conditions of SR 100 and Seminole Woods Parkway were determined using Synchro 8 software. The signal timing information was obtained from the City of Palm Coast and the coordination timing plan was obtained from the previous work efforts performed by GMB for FDOT. Table 3 summarizes the intersection delay and levels of service (LOS) for before and after conditions during the three peak periods. As shown in the table, the intersection of SR 100 and Seminole Woods Parkway is expected to operate better with a significant improvement in operating conditions on the northbound approach.

Table 3: Before and After Operational Analysis Results

		A.M. Peak Hour				Mid-Day				P.M. Peak Hour			
		Before		After		Before		After		Before		After	
Direction	Move-ment	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
Eastbound	Left	64.1	E	64.1	E	67.9	E	67.9	E	68.2	E	68.2	E
	Through	24.6	C	22.4	C	27.2	C	26.1	C	28.4	C	28.4	C
	Right	24.6	C	22.4	C	27.1	C	26.1	C	28.4	C	28.4	C
Westbound	Left	60.4	E	60.4	E	70.4	E	70.6	E	73.0	E	73.0	E
	Through	27.3	C	24.6	C	22.7	C	21.7	C	23.3	C	23.3	C
	Right	27.2	C	24.6	C	22.6	C	21.7	C	23.3	C	23.3	C
Northbound	Left	39.8	D	43.7	D	47.8	D	49.0	D	48.6	D	48.6	D
	Through	256.5	F	52.3	D	64.3	E	56.5	E	57.7	E	52.2	D
	Right			54.4	D			56.2	E			52.9	D
Southbound	Left	48.2	D	44.9	D	48.5	D	48.9	D	49.6	D	49.1	D
	Through	45.9	D	49.8	D	53.9	D	55.7	E	55.9	E	55.9	E
	Right	50.0	D	62.5	E	54.3	E	56.3	E	56.6	E	56.6	E
	Over All	**58.8**	**E**	**34.4**	**C**	**33.9**	**C**	**33.1**	**C**	**34.5**	**C**	**34.3**	**C**

Queue Length Analysis

The 95th percentile queue for the northbound through and left movement obtained from HCM methodology and SimTraffic simulation were compared to determine the recommended storage length for the northbound left turn lane. The table below shows the comparison of the 95th percentile queue lengths. The most conservative value derived was a length of 200'; however since the distance between SR 100 and the first median opening to the south is only 350', there wouldn't be enough room for adequate deceleration if this value was used. Therefore, the recommended queue length is 140', which represents the most conservative value derived utilizing the SimTraffic software, and still allows for adequate deceleration without extending the left turn lane past the median opening.

Table 4: Queue Length Analysis Results

	Northbound Left		Northbound Through	
	HCM	SimTraffic	HCM	SimTraffic
A.M. Peak Hour	200	123	175	125
Mid-Day	150	126	100	78
P.M. Peak Hour	150	**140**	75	89

Benefit/Cost Analysis

A benefit cost analysis was performed for the study intersection to estimate the effectiveness of the potential intersection improvement using SimTraffic simulation. The benefits are defined in terms of annualized cost savings associated with reductions in the following three measures of effectiveness (MOEs):

- Total Delay (Vehicle-Hours)
- Stops
- Fuel Consumption (Gallons)

The benefits were calculated for 300 days in a year accounting for reduced benefits anticipated due to lower traffic volumes during the weekend. The value of delay time per hour ($16.79) and fuel cost ($3.24) were obtained from "The Mobility Data for Orlando" published by Texas A&M University. Stops were estimated to cost $0.014 each. Table 4 summarizes the unit value of each MOE in a tabular format along with its source.

Table 5: Unit Value of MOEs

MOE Values	Unit Value	Source
Stops ($)	0.014	Transyt 7F
Delay ($)	16.79	2011 Urban Mobility Report published by Texas A&M Transportation Institute (TTI)
Fuel ($/gal.)	3.24	2011 Urban Mobility Report published by TTI
Days per Year	300	Average days with observable AM & PM peaking characteristics

The estimated cost for the proposed modification is $37,450.38 (present day value) and it has a corresponding annualized cost amounting to $2,754.34. The service life for the modification is assumed 20 years and the interest rate used in the calculation of annualized costs is assumed 7%, which is a value frequently used by the Florida Department of Transportation (FDOT) in their benefit cost computations. The Cost Estimate for the proposed lane addition can be found in Appendix C.

Table 5 summarizes the benefit cost analysis for the proposed lane. The analysis yields a B/C ratio of 8.09. The calculated B/C ratio indicates that the anticipated benefits outweigh the

estimated costs for the proposed modification, with benefits derived through reduced costs associated with lower delay, stops and fuel consumption.

Table 6: Benefit/Cost Analysis Results

Benefit Period		Measures of Effectiveness		
		Total Stops	Total Delay (veh-hrs)	Fuel Consumption (gal)
AM Peak Hour	Existing	1,779	23.9	36.6
	Proposed	1,708	21.0	35.9
Mid-Day	Existing	1,756	23.1	39.1
	Proposed	1,606	22.9	37.2
PM Peak Hour	Existing	1,843	24.7	41.3
	Proposed	1,837	24.2	40.6
Estimated Daily (AM + Mid + PM)	Existing	5,378	71.7	117.0
	Proposed	5,151	68.1	113.7
Estimated Daily Savings		227	3.6	3.3
Estimated Unit Cost		$0.014	$16.790	$3.240
Daily User Benefit by MOE		$3.178	$60.444	$10.692
Daily User Benefit Total		74.31		
Annual User Benefit		**$22,294.20**		
Total Annual Cost		**$2,754.34**		
Benefit Cost Ratio		**8.09**		

RECOMMENDATIONS

Based upon the crash and speed analyses, qualitative assessment, field observations, intersection analysis, B/C Analysis and engineering judgment, the following modifications are recommended to improve the safety and operation of the intersection:

1: Construct a separate left turn lane on Seminole Woods Parkway and convert the existing left turn lane to a through lane and the existing combined through/right turn lane to a right turn only lane. Because of the physical constraints found at the intersection and the high costs associated with their modification, the addition of a separate right turn lane is not considered feasible at this location. In lieu of a separate right turn lane, it is recommended that a separate left turn lane be constructed in the median, and that the existing left turn lane be converted to a through lane and the existing combined through/right turn lane be converted to an exclusive right turn lane. The installation of a separate northbound left turn lane will have a beneficial effect to the operation of the northbound movement as well as to the intersection as a whole, particularly during the a.m. peak hour when the delay and LOS will decrease from 58.8 sec./LOS E to 34.4 sec./LOS C. The recommended queue length is 140' and the deceleration length is based on a design speed of 45 mph since vehicles are presumably slowing due to the presence of rumble strips on the approach, the impending signal ahead and a posted speed limit of 25 mph on the opposite side of SR 100. This modification can be implemented at an approximate cost of $37,450.38 and yields a B/C ratio of 8.09, which indicates that the anticipated benefits outweigh the estimated costs for the proposed modification.

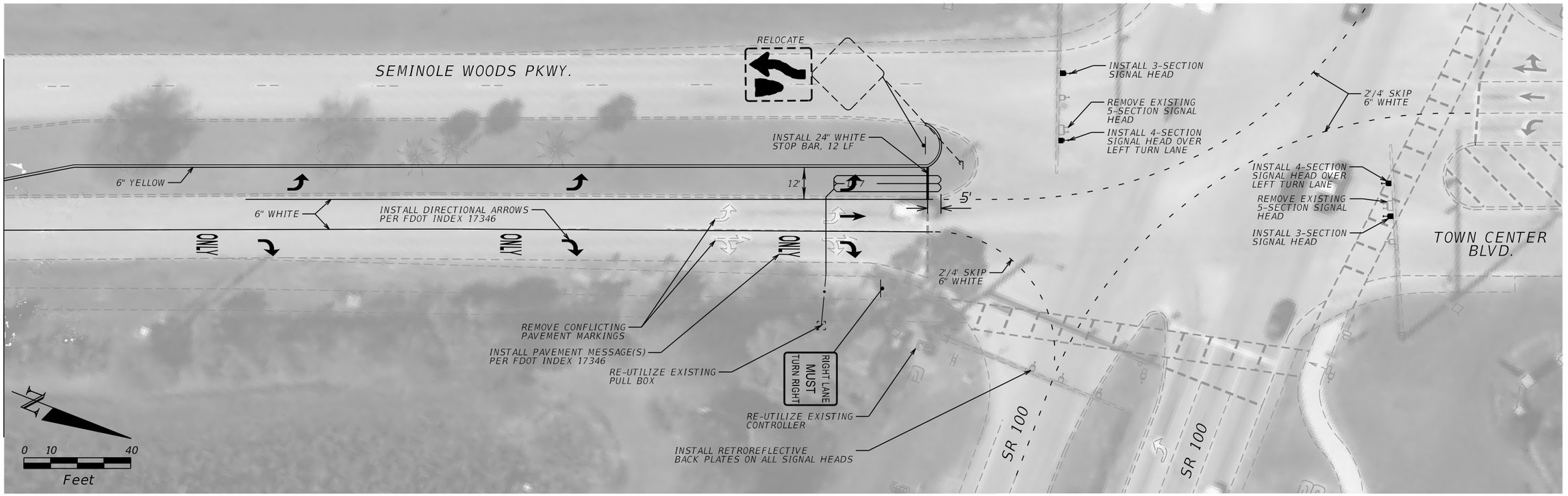
2: Install 2'-4' white skip pavement markings for the NB and SB left turn movements and the NB right turn movement. During the QA it was observed that the EB and WB left turn movements had skip pavement whereas the NB and SB left turn movements did not. In addition, a minor pattern of sideswipe crashes between the southbound left turn movement and the northbound right turn movement was noted in the Crash Analysis. Installation of the skip pavement markings will provide guidance to vehicles turning left from Town Center Boulevard and Seminole Woods Parkway, and right from Seminole Woods Parkway, and may

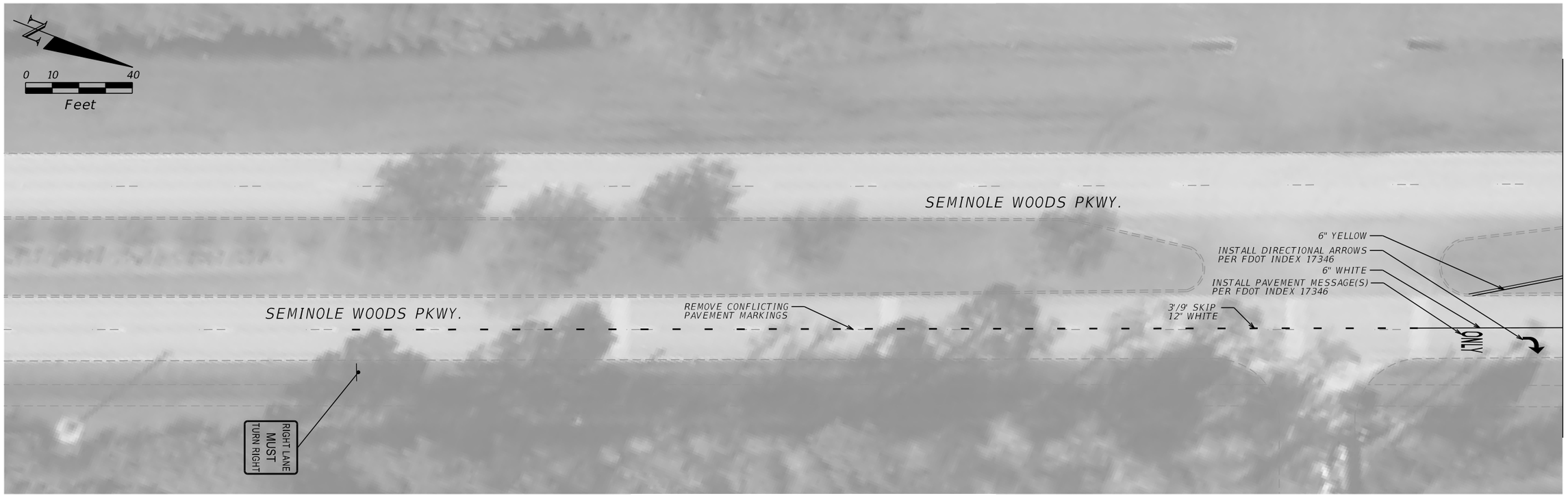
reduce or eliminate the sideswipe conflicts occurring between the SB left and the NB right turn movements.

3: Install retro-reflective back plates on all signal heads. The existing eastbound and westbound signal heads are equipped with standard back plates; however the signal heads on the northbound and southbound approaches are not. In an effort to mitigate the number of rear end crashes by increasing the visibility of the signal heads, it is recommended that the existing back plates be replaced with retro-reflective back plates, and that retro-reflective back plates be installed on the northbound and southbound signal heads as well. The existing yellow and all red clearance intervals were also evaluated in order to determine if they could be adjusted in order to help reduce rear end crashes; however they were found to be compliant with current TEM criteria.

4: Install 4-section signal heads over the northbound and southbound left turn lanes. Studies show that the 4-section signal heads improve the safety of an intersection by providing a more direct, and less confusing message to motorists, and are more efficient by providing more options for controlling traffic.

The proposed improvements are illustrated in the Figure 4 Conceptual Improvement Diagram shown on the following page.





REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GMB Engineers & Planners, Inc.
2602 E. Livingston St
Orlando, FL 32803
Phone: 407-898-5424 Fax: 407-898-5425

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	FLAGLER	

CONCEPTUAL IMPROVEMENT DIAGRAM

FIGURE NO. 4

$USER$ $DATE$ $TIME$ $FILE$

APPENDICES

APPENDIX A:

Traffic Data

Roadway Count Summary

Start Date : November 18, 2014 Start Time 00:00
Stop Date : November 18, 2014 Stop Time 24:00
County : Flagler Station Number 3
Location : #3 - Seminole Woods Pkwy. north of SR-100 (approach count, bi-directional)

18-Nov-14 **Northbound Volume**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	3	1	1	2	0	0	12	20	81	55	36	43
30	5	2	7	2	0	2	12	35	86	45	35	28
45	2	0	1	0	4	3	22	33	33	26	47	30
00	1	1	1	0	1	7	31	79	43	46	22	27
Hr Total	**11**	**4**	**10**	**4**	**5**	**12**	**77**	**167**	**243**	**172**	**140**	**128**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	18	32	40	59	36	50	30	22	16	15	15	4
30	33	36	48	47	51	49	32	28	9	5	9	5
45	46	38	57	46	56	50	34	24	16	8	2	9
00	33	40	66	48	61	34	24	15	13	12	4	2
Hr Total	**130**	**146**	**211**	**200**	**204**	**183**	**120**	**89**	**54**	**40**	**30**	**20**

24 Hour Total : 2,400
AM Peak Hour begins : 7:30 AM Peak Volume : 279 AM Peak Hour Factor : 0.81
PM Peak Hour begins : 14:15 PM Peak Volume : 230 PM PeaK Hour Factor : 0.87

18-Nov-14 **Southbound Volume**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	7	1	0	1	1	0	9	36	92	44	43	53
30	1	1	5	0	3	2	16	42	110	39	45	44
45	7	5	0	0	4	3	19	40	55	37	50	38
00	3	1	2	4	3	4	26	53	46	39	39	48
Hr Total	**18**	**8**	**7**	**5**	**11**	**9**	**70**	**171**	**303**	**159**	**177**	**183**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	41	31	60	100	47	64	36	36	17	17	5	3
30	43	48	47	100	54	58	37	17	12	12	5	6
45	41	31	51	54	76	61	35	26	7	15	5	5
00	29	52	62	48	59	44	32	16	8	6	4	4
Hr Total	**154**	**162**	**220**	**302**	**236**	**227**	**140**	**95**	**44**	**50**	**19**	**18**

24 Hour Total : 2,788
AM Peak Hour begins : 7:45 AM Peak Volume : 310 AM Peak Hour Factor : 0.71
PM Peak Hour begins : 14:45 PM Peak Volume : 316 PM PeaK Hour Factor : 0.79

18-Nov-14 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	10	2	1	3	1	0	21	56	173	99	79	96
30	6	3	12	2	3	4	28	77	196	84	80	72
45	9	5	1	0	8	6	41	73	88	63	97	68
00	4	2	3	4	4	11	57	132	89	85	61	75
Hr Total	**29**	**12**	**17**	**9**	**16**	**21**	**147**	**338**	**546**	**331**	**317**	**311**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	59	63	100	159	83	114	66	58	33	32	20	7
30	76	84	95	147	105	107	69	45	21	17	14	11
45	87	69	108	100	132	111	69	50	23	23	7	14
00	62	92	128	96	120	78	56	31	21	18	8	6
Hr Total	**284**	**308**	**431**	**502**	**440**	**410**	**260**	**184**	**98**	**90**	**49**	**38**

24 Hour Total : 5,188
AM Peak Hour begins : 7:45 AM Peak Volume : 589 AM Peak Hour Factor : 0.75
PM Peak Hour begins : 14:30 PM Peak Volume : 542 PM PeaK Hour Factor : 0.85

Roadway Count Summary

Start Date : November 18, 2014 Start Time 00:00
Stop Date : November 18, 2014 Stop Time 24:00
County : Flagler Station Number 4
Location : #4 - Seminole Woods Pkwy. south of SR-100 (approach count, bi-directional)

18-Nov-14 **Northbound Volume**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	2	1	3	2	5	8	26	81	95	60	59	62
30	6	3	5	2	11	19	42	80	110	51	43	59
45	4	3	1	0	15	36	67	118	88	52	65	55
00	5	3	1	2	19	35	55	94	88	60	48	58
Hr Total	**17**	**10**	**10**	**6**	**50**	**98**	**190**	**373**	**381**	**223**	**215**	**234**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	50	59	61	68	62	68	63	33	15	19	13	7
30	62	75	53	76	77	61	53	28	25	16	8	7
45	58	65	65	73	63	61	61	34	17	12	7	5
00	45	67	71	71	80	70	46	23	27	10	3	3
Hr Total	**215**	**266**	**250**	**288**	**282**	**260**	**223**	**118**	**84**	**57**	**31**	**22**

24 Hour Total : 3,903
AM Peak Hour begins : 7:30 AM Peak Volume : 417 AM Peak Hour Factor : 0.88
PM Peak Hour begins : 14:45 PM Peak Volume : 288 PM PeaK Hour Factor : 0.95

18-Nov-14 **Southbound Volume**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	15	9	3	2	3	6	8	17	45	55	46	42
30	6	1	5	1	6	2	9	22	62	54	30	48
45	4	6	4	2	2	4	17	54	52	52	33	60
00	5	3	6	3	2	11	14	44	59	29	55	51
Hr Total	**30**	**19**	**18**	**8**	**13**	**23**	**48**	**137**	**218**	**190**	**164**	**201**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	62	63	55	61	97	107	102	64	55	38	25	12
30	60	53	74	95	88	105	85	50	49	41	21	16
45	56	64	61	94	92	101	83	56	41	35	23	15
00	72	67	63	90	111	95	76	39	40	18	13	4
Hr Total	**250**	**247**	**253**	**340**	**388**	**408**	**346**	**209**	**185**	**132**	**82**	**47**

24 Hour Total : 3,956
AM Peak Hour begins : 11:30 AM Peak Volume : 233 AM Peak Hour Factor : 0.94
PM Peak Hour begins : 16:45 PM Peak Volume : 424 PM PeaK Hour Factor : 0.96

18-Nov-14 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	17	10	6	4	8	14	34	98	140	115	105	104
30	12	4	10	3	17	21	51	102	172	105	73	107
45	8	9	5	2	17	40	84	172	140	104	98	115
00	10	6	7	5	21	46	69	138	147	89	103	109
Hr Total	**47**	**29**	**28**	**14**	**63**	**121**	**238**	**510**	**599**	**413**	**379**	**435**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	112	122	116	129	159	175	165	97	70	57	38	19
30	122	128	127	171	165	166	138	78	74	57	29	23
45	114	129	126	167	155	162	144	90	58	47	30	20
00	117	134	134	161	191	165	122	62	67	28	16	7
Hr Total	**465**	**513**	**503**	**628**	**670**	**668**	**569**	**327**	**269**	**189**	**113**	**69**

24 Hour Total : 7,859
AM Peak Hour begins : 7:30 AM Peak Volume : 622 AM Peak Hour Factor : 0.90
PM Peak Hour begins : 16:45 PM Peak Volume : 694 PM PeaK Hour Factor : 0.91

Roadway Count Summary

Start Date : November 18, 2014 Start Time 00:00
Stop Date : November 18, 2014 Stop Time 24:00
County : Flagler Station Number 2
Location : #2 - SR-100 east of Seminole Woods Pkwy. (approach count, bi-directional)

18-Nov-14 **Eastbound Volume**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	21	11	5	13	28	34	89	213	281	236	244	260
30	15	4	10	21	44	69	126	234	310	207	221	213
45	15	6	9	10	57	147	156	322	298	206	244	248
00	9	8	10	15	44	108	162	319	278	221	233	256
Hr Total	**60**	**29**	**34**	**59**	**173**	**358**	**533**	**1,088**	**1,167**	**870**	**942**	**977**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	233	242	281	240	240	264	200	178	80	52	46	14
30	223	271	266	298	308	289	186	125	97	54	26	19
45	208	257	235	296	292	246	149	109	93	65	30	12
00	252	244	274	282	279	234	138	120	82	43	16	11
Hr Total	**916**	**1,014**	**1,056**	**1,116**	**1,119**	**1,033**	**673**	**532**	**352**	**214**	**118**	**56**

24 Hour Total : 14,489
AM Peak Hour begins : 7:30 AM Peak Volume : 1,232 AM Peak Hour Factor : 0.96
PM Peak Hour begins : 16:15 PM Peak Volume : 1,143 PM PeaK Hour Factor : 0.93

18-Nov-14 **Westbound Volume**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	23	15	12	10	11	17	40	121	192	208	192	228
30	22	7	14	10	8	18	53	136	196	159	179	214
45	13	9	4	11	3	35	72	189	232	204	250	237
00	24	4	19	10	16	39	105	226	227	202	204	264
Hr Total	**82**	**35**	**49**	**41**	**38**	**109**	**270**	**672**	**847**	**773**	**825**	**943**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	248	231	237	237	252	300	281	143	111	76	71	34
30	265	256	257	287	274	321	184	150	115	59	55	35
45	261	247	249	317	326	374	172	117	65	72	41	38
00	262	232	277	292	344	268	182	76	72	60	35	19
Hr Total	**1,036**	**966**	**1,020**	**1,133**	**1,196**	**1,263**	**819**	**486**	**363**	**267**	**202**	**126**

24 Hour Total : 13,561
AM Peak Hour begins : 11:45 AM Peak Volume : 1,038 AM Peak Hour Factor : 0.98
PM Peak Hour begins : 16:45 PM Peak Volume : 1,339 PM PeaK Hour Factor : 0.90

18-Nov-14 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	44	26	17	23	39	51	129	334	473	444	436	488
30	37	11	24	31	52	87	179	370	506	366	400	427
45	28	15	13	21	60	182	228	511	530	410	494	485
00	33	12	29	25	60	147	267	545	505	423	437	520
Hr Total	**142**	**64**	**83**	**100**	**211**	**467**	**803**	**1,760**	**2,014**	**1,643**	**1,767**	**1,920**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	481	473	518	477	492	564	481	321	191	128	117	48
30	488	527	523	585	582	610	370	275	212	113	81	54
45	469	504	484	613	618	620	321	226	158	137	71	50
00	514	476	551	574	623	502	320	196	154	103	51	30
Hr Total	**1,952**	**1,980**	**2,076**	**2,249**	**2,315**	**2,296**	**1,492**	**1,018**	**715**	**481**	**320**	**182**

24 Hour Total : 28,050
AM Peak Hour begins : 7:45 AM Peak Volume : 2,054 AM Peak Hour Factor : 0.94
PM Peak Hour begins : 16:45 PM Peak Volume : 2,417 PM PeaK Hour Factor : 0.97

Roadway Count Summary

Start Date : November 18, 2014 Start Time 00:00
Stop Date : November 18, 2014 Stop Time 24:00
County : Flagler Station Number 1
Location : #1 - SR-100 west of Seminole Woods Pkwy. (approach count, bi-directional)

18-Nov-14 **Eastbound Volume**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	25	9	4	16	19	33	63	140	218	212	207	217
30	13	5	7	10	36	49	94	220	220	188	209	204
45	9	5	13	12	38	103	123	239	236	175	203	220
00	7	7	6	13	23	84	117	269	228	192	225	217
Hr Total	**54**	**26**	**30**	**51**	**116**	**269**	**397**	**868**	**902**	**767**	**844**	**858**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	216	240	260	205	228	274	170	147	92	54	34	4
30	207	213	241	242	270	252	185	103	75	50	32	21
45	227	235	215	296	242	186	136	99	101	53	19	9
00	240	234	269	237	257	214	133	108	63	37	18	9
Hr Total	**890**	**922**	**985**	**980**	**997**	**926**	**624**	**457**	**331**	**194**	**103**	**43**

24 Hour Total : 12,634
AM Peak Hour begins : 7:15 AM Peak Volume : 946 AM Peak Hour Factor : 0.88
PM Peak Hour begins : 16:15 PM Peak Volume : 1,043 PM PeaK Hour Factor : 0.95

18-Nov-14 **Westbound Volume**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
00	0	0	0	0	0	0	0	0	0	0	0	0
Hr Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
00	0	0	0	0	0	0	0	0	0	0	0	0
Hr Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

24 Hour Total : 0
AM Peak Hour begins : AM Peak Volume : 0 AM Peak Hour Factor :
PM Peak Hour begins : PM Peak Volume : 0 PM PeaK Hour Factor :

18-Nov-14 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	25	9	4	16	19	33	63	140	218	212	207	217
30	13	5	7	10	36	49	94	220	220	188	209	204
45	9	5	13	12	38	103	123	239	236	175	203	220
00	7	7	6	13	23	84	117	269	228	192	225	217
Hr Total	**54**	**26**	**30**	**51**	**116**	**269**	**397**	**868**	**902**	**767**	**844**	**858**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	216	240	260	205	228	274	170	147	92	54	34	4
30	207	213	241	242	270	252	185	103	75	50	32	21
45	227	235	215	296	242	186	136	99	101	53	19	9
00	240	234	269	237	257	214	133	108	63	37	18	9
Hr Total	**890**	**922**	**985**	**980**	**997**	**926**	**624**	**457**	**331**	**194**	**103**	**43**

24 Hour Total : 12,634
AM Peak Hour begins : 7:15 AM Peak Volume : 946 AM Peak Hour Factor : 0.88
PM Peak Hour begins : 16:15 PM Peak Volume : 1,043 PM PeaK Hour Factor : 0.95

Roadway Count Summary

GMB Engineers & Planners, Inc.

County Flagler **City** Flagler Beach

Intersection Seminole Woods Pwky & SR 100

Date November 17, 2014

Time Period 7:30 AM to 11:30 AM **All Vehicles**

GMB Project #: 13-094.01

Time Period	Northbound				Southbound			
	Left	Through	Right	Total	Left	Through	Right	Total
7:30 - 7:45	58	6	51	115	21	7	8	36
7:45 - 8:00	43	32	41	116	18	3	21	42
8:00 - 8:15	25	43	20	88	39	16	28	83
8:15 - 8:30	33	42	37	112	52	30	27	109
8:30 - 8:45	40	7	60	107	24	5	23	52
8:45 - 9:00	43	15	45	103	27	8	15	50
9:00 - 9:15	26	17	23	66	11	8	21	40
9:15 - 9:30	16	13	23	52	21	6	14	41
9:30 - 9:45	20	8	28	56	17	13	9	39
9:45 - 10:00	18	13	17	48	15	4	14	33
10:00 - 10:15	22	9	20	51	14	6	19	39
10:15 - 10:30	26	4	8	38	19	2	18	39
10:30 - 10:45	29	13	13	55	18	29	20	67
10:45 - 11:00	28	18	21	67	16	8	19	43
11:00 - 11:15	20	8	30	58	23	8	19	50
11:15 - 11:30	22	5	10	37	15	7	20	42
TOTAL	**469**	**253**	**447**	**1,169**	**350**	**160**	**295**	**805**

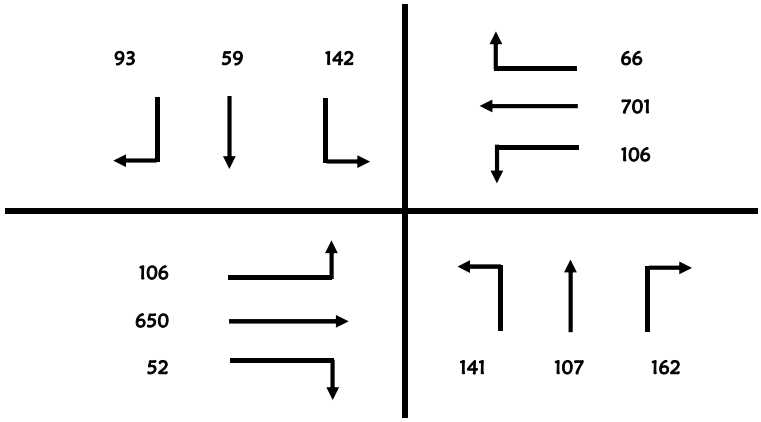
Time Period	Eastbound				Westbound			
	Left	Through	Right	Total	Left	Through	Right	Total
7:30 - 7:45	10	181	17	208	22	144	10	176
7:45 - 8:00	31	169	18	218	12	198	22	232
8:00 - 8:15	31	133	6	170	20	153	16	189
8:15 - 8:30	30	163	10	203	27	150	28	205
8:30 - 8:45	23	176	18	217	23	190	11	224
8:45 - 9:00	22	178	18	218	36	208	11	255
9:00 - 9:15	20	144	15	179	33	159	25	217
9:15 - 9:30	40	127	16	183	28	120	7	155
9:30 - 9:45	23	145	13	181	29	171	6	206
9:45 - 10:00	22	160	8	190	15	166	11	192
10:00 - 10:15	17	173	16	206	23	152	13	188
10:15 - 10:30	17	156	5	178	12	144	14	170
10:30 - 10:45	23	126	8	157	10	183	23	216
10:45 - 11:00	13	146	26	185	18	167	9	194
11:00 - 11:15	29	169	22	220	21	207	15	243
11:15 - 11:30	23	145	13	181	23	184	11	218
TOTAL	**374**	**2,491**	**229**	**3,094**	**352**	**2,696**	**232**	**3,280**

North / South
Seminole Woods Pwky

East / West
SR 100

Peak Hour
8:00 - 9:00

Peak Hour Factor
0.95



Roadway Count Summary

GMB Engineers & Planners, Inc.

County	Flagler	**City**	Flagler Beach
Intersection	Seminole Woods Pwky	&	SR 100
Date	November 17, 2014		
Time Period	12:00 PM to 4:00 PM		**All Vehicles**

GMB Project #: 13-094.01

Time Period	Northbound				Southbound			
	Left	Through	Right	Total	Left	Through	Right	Total
12:00 - 12:15	23	6	18	47	19	2	19	40
12:15 - 12:30	35	6	21	62	14	9	11	34
12:30 - 12:45	25	4	25	54	7	7	21	35
12:45 - 13:00	29	10	19	58	16	7	11	34
13:00 - 13:15	37	58	18	113	14	76	14	104
13:15 - 13:30	32	3	32	67	25	1	19	45
13:30 - 13:45	32	61	26	119	15	56	18	89
13:45 - 14:00	30	14	19	63	12	11	16	39
14:00 - 14:15	31	7	28	66	22	9	24	55
14:15 - 14:30	21	10	20	51	17	5	18	40
14:30 - 14:45	20	10	22	52	20	12	17	49
14:45 - 15:00	26	17	26	69	14	9	29	52
15:00 - 15:15	11	23	20	54	30	22	32	84
15:15 - 15:30	33	13	34	80	32	26	37	95
15:30 - 15:45	26	6	34	66	25	10	14	49
15:45 - 16:00	27	11	20	58	16	9	19	44
TOTAL	**438**	**259**	**382**	**1,079**	**298**	**271**	**319**	**888**

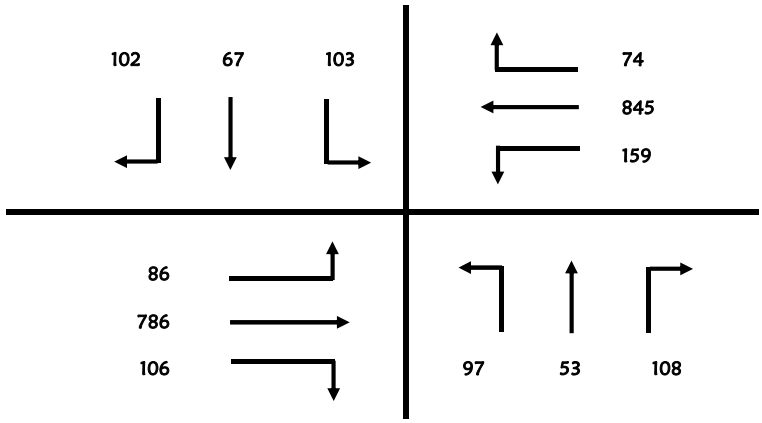
Time Period	Eastbound				Westbound			
	Left	Through	Right	Total	Left	Through	Right	Total
12:00 - 12:15	15	156	15	186	35	179	3	217
12:15 - 12:30	20	162	27	209	23	236	14	273
12:30 - 12:45	30	144	17	191	30	197	30	257
12:45 - 13:00	19	184	22	225	25	210	13	248
13:00 - 13:15	31	105	10	146	28	141	2	171
13:15 - 13:30	14	139	16	169	23	173	20	216
13:30 - 13:45	11	118	16	145	13	138	8	159
13:45 - 14:00	15	154	24	193	31	187	13	231
14:00 - 14:15	20	207	23	250	23	191	15	229
14:15 - 14:30	21	190	32	243	28	192	18	238
14:30 - 14:45	20	166	22	208	29	179	25	233
14:45 - 15:00	27	198	23	248	27	201	25	253
15:00 - 15:15	29	154	17	200	20	188	13	221
15:15 - 15:30	16	204	24	244	41	209	20	270
15:30 - 15:45	24	221	35	280	51	236	21	308
15:45 - 16:00	17	207	30	254	47	212	20	279
TOTAL	**329**	**2,709**	**353**	**3,391**	**474**	**3,069**	**260**	**3,803**

North / South
Seminole Woods Pwky

East / West
SR 100

Peak Hour
15:00 - 16:00

Peak Hour Factor
0.92



Roadway Count Summary

GMB Engineers & Planners, Inc.

County	Flagler	**City**	Flagler Beach
Intersection	Seminole Woods Pkwy	&	SR 100
Date	November 17, 2014		**All Vehicles**
Time Period	16:30 to 18:30		

GMB Project #: 13-094.01

Time Period	Northbound			Southbound		
	Left	Through	Right	Left	Through	Right
16:30 - 16:45	25	18	25	27	18	30
16:45 - 17:00	40	11	30	20	17	19
17:00 - 17:15	27	11	19	17	12	33
17:15 - 17:30	26	5	23	21	13	22
17:30 - 17:45	29	13	32	28	18	17
17:45 - 18:00	24	9	38	16	9	14
18:00 - 18:15	38	6	23	15	5	13
18:15 - 18:30	33	9	16	14	15	7
	242	82	206	158	107	155

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
16:30 - 16:45	18	194	32	41	235	25
16:45 - 17:00	26	197	40	48	245	21
17:00 - 17:15	22	199	47	49	237	21
17:15 - 17:30	18	184	43	46	229	23
17:30 - 17:45	19	143	29	58	258	26
17:45 - 18:00	14	161	39	50	216	16
18:00 - 18:15	9	137	43	52	190	16
18:15 - 18:30	15	132	33	34	140	13
	141	1,347	306	378	1,750	161

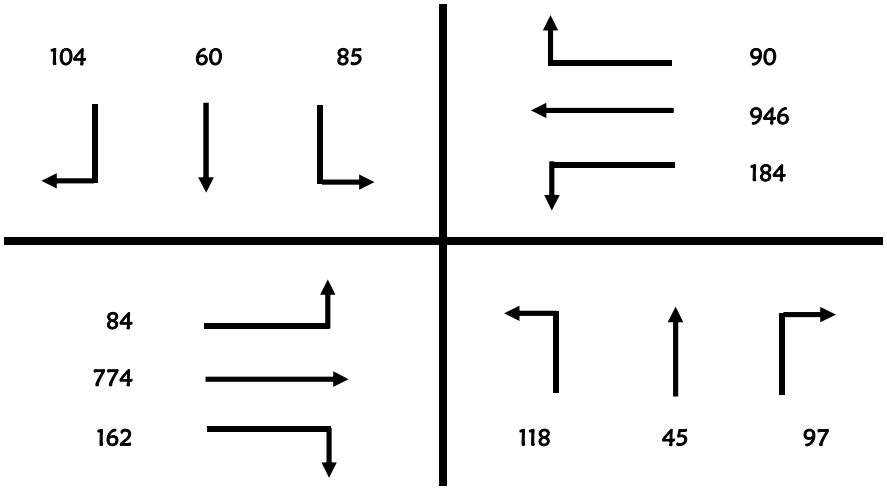
North / South
Seminole Woods Pkwy

East / West
SR 100

Peak Hour
16:30 - 17:30

Peak Hour Factor
0.96

Total Pk Hr Voume
2,749



Bicycle & Pedestrian Movement Summary

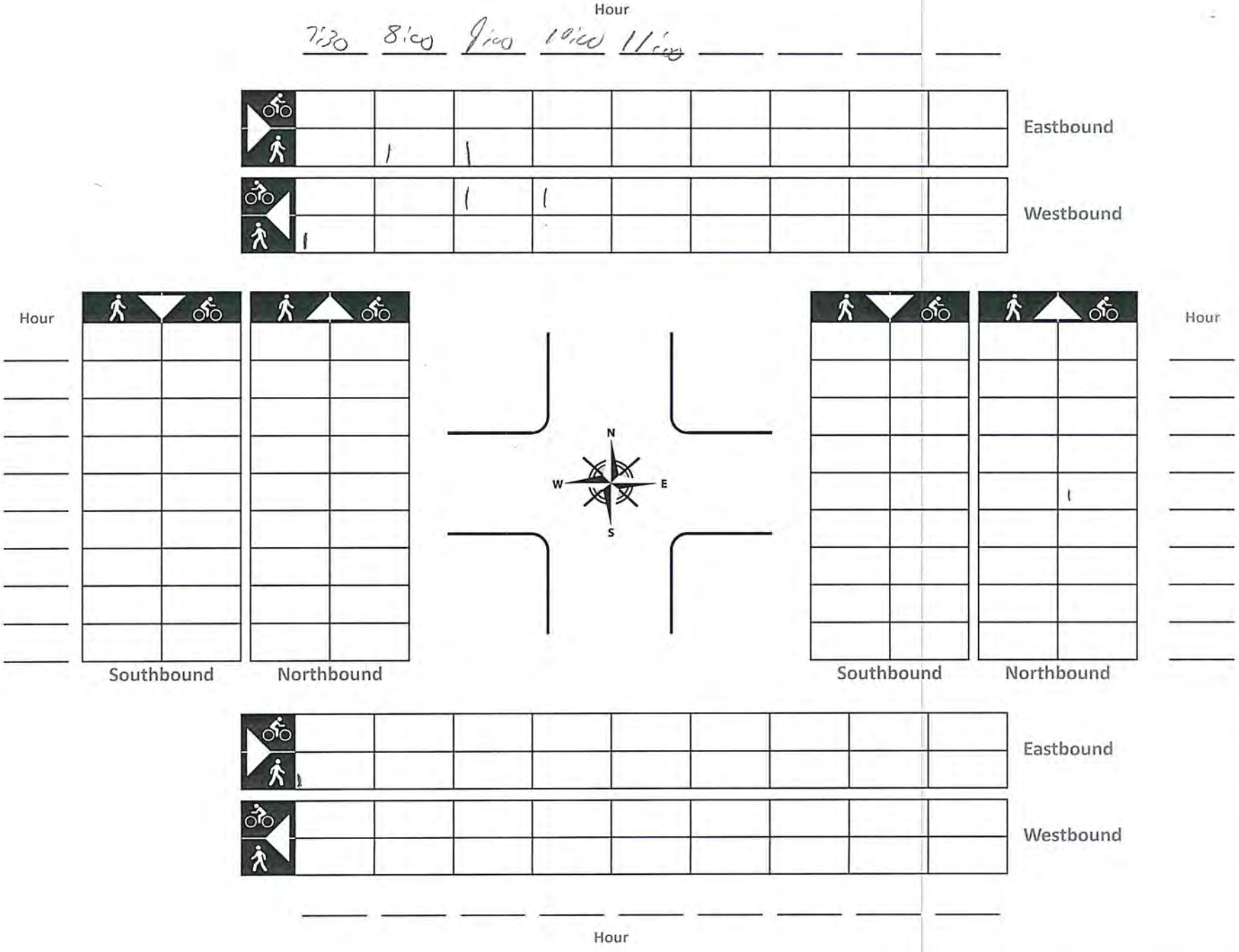
GMB ENGINEERS & PLANNERS, INC.

Name: Braden **Date:** 12/5/14

Project: 13-0941.01

NB/SB: NB/SB **EB/WB:** EB/WB

Additional Notes & Observations:



GMB ENGINEERS & PLANNERS, INC.

Additional Notes & Observations:

Name: Bryan Dan **Date:** 12/5/14

Project: 13-094.01

NB/SB: NB/SB **EB/WB:** EB/WB

Bicycle & Pedestrian Movement Summary

Hour

12:00 1:00

Eastbound

Westbound

Hour

12:00
1:00

Southbound Northbound

N W E S

Hour

12:00
1:00

Southbound Northbound

Eastbound

Westbound

12:00 1:00

Hour

APPENDIX B:
Traffic Operation Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	106	650	52	106	701	66	141	107	162	142	59	93
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1900	1827	1846	1900	1863	1881	1900	1881	1867	1900
Adj Flow Rate, veh/h	112	684	55	112	738	69	148	113	171	149	62	98
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	3	3	2	1	1	1	3	3
Cap, veh/h	140	1344	108	139	1348	126	290	81	122	217	198	177
Arrive On Green	0.08	0.41	0.41	0.08	0.42	0.42	0.09	0.12	0.12	0.08	0.11	0.11
Sat Flow, veh/h	1810	3255	262	1740	3243	303	1774	677	1024	1792	1774	1587
Grp Volume(v), veh/h	112	364	375	112	399	408	148	0	284	149	62	98
Grp Sat Flow(s),veh/h/ln	1810	1736	1781	1740	1754	1793	1774	0	1701	1792	1774	1587
Q Serve(g_s), s	6.7	17.2	17.2	7.0	18.9	18.9	8.0	0.0	13.1	8.0	3.5	6.4
Cycle Q Clear(g_c), s	6.7	17.2	17.2	7.0	18.9	18.9	8.0	0.0	13.1	8.0	3.5	6.4
Prop In Lane	1.00		0.15	1.00		0.17	1.00		0.60	1.00		1.00
Lane Grp Cap(c), veh/h	140	717	735	139	729	745	290	0	203	217	198	177
V/C Ratio(X)	0.80	0.51	0.51	0.81	0.55	0.55	0.51	0.00	1.40	0.69	0.31	0.55
Avail Cap(c_a), veh/h	199	717	735	223	729	745	309	0	203	217	198	177
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.9	24.0	24.0	49.8	24.3	24.3	38.4	0.0	48.5	39.4	45.0	46.3
Incr Delay (d2), s/veh	14.2	0.6	0.6	10.6	2.9	2.9	1.4	0.0	208.0	8.7	0.9	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.0	13.0	13.3	6.8	14.8	15.1	7.2	0.0	32.1	7.9	3.2	5.4
LnGrp Delay(d),s/veh	64.1	24.6	24.6	60.4	27.3	27.2	39.8	0.0	256.5	48.2	45.9	50.0
LnGrp LOS	E	C	C	E	C	C	D		F	D	D	D
Approach Vol, veh/h		851			919			432			309	
Approach Delay, s/veh		29.8			31.3			182.3			48.3	
Approach LOS		C			C			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	53.6	18.0	22.0	16.7	53.3	18.8	21.2
Change Period (Y+Rc), s	7.9	7.9	* 8.7	* 8.9	7.9	7.9	* 8.9	* 8.9
Max Green Setting (Gmax), s	12.1	42.1	* 9.3	* 13	14.1	40.1	* 11	* 11
Max Q Clear Time (g_c+I1), s	8.7	20.9	10.0	15.1	9.0	19.2	10.0	8.4
Green Ext Time (p_c), s	0.1	10.5	0.0	0.0	0.1	10.4	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	58.8
HCM 2010 LOS	E

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2454	2475	2343	2316	2304	2379
Vehs Exited	2457	2457	2324	2299	2290	2365
Starting Vehs	59	38	39	54	46	46
Ending Vehs	56	56	58	71	60	62
Travel Distance (mi)	946	950	897	887	888	914
Travel Time (hr)	57.6	58.2	56.9	55.1	52.6	56.1
Total Delay (hr)	24.4	24.7	25.4	23.9	21.3	23.9
Total Stops	1881	1827	1779	1747	1657	1779
Fuel Used (gal)	37.8	38.3	36.6	35.8	34.7	36.6

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2454	2475	2343	2316	2304	2379
Vehs Exited	2457	2457	2324	2299	2290	2365
Starting Vehs	59	38	39	54	46	46
Ending Vehs	56	56	58	71	60	62
Travel Distance (mi)	946	950	897	887	888	914
Travel Time (hr)	57.6	58.2	56.9	55.1	52.6	56.1
Total Delay (hr)	24.4	24.7	25.4	23.9	21.3	23.9
Total Stops	1881	1827	1779	1747	1657	1779
Fuel Used (gal)	37.8	38.3	36.6	35.8	34.7	36.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	106	650	52	106	701	66	141	107	162	142	59	93
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1900	1827	1846	1900	1863	1881	1881	1881	1867	1900
Adj Flow Rate, veh/h	112	684	55	112	738	69	148	113	100	149	62	98
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	3	3	2	1	1	1	3	3
Cap, veh/h	140	1430	115	139	1433	134	257	175	149	258	147	132
Arrive On Green	0.08	0.44	0.44	0.08	0.44	0.44	0.09	0.09	0.09	0.08	0.08	0.08
Sat Flow, veh/h	1810	3255	262	1740	3243	303	1774	1881	1599	1792	1774	1587
Grp Volume(v), veh/h	112	364	375	112	399	408	148	113	100	149	62	98
Grp Sat Flow(s),veh/h/ln	1810	1736	1781	1740	1754	1793	1774	1881	1599	1792	1774	1587
Q Serve(g_s), s	6.7	16.4	16.4	7.0	18.1	18.1	8.3	6.4	6.7	8.3	3.7	6.6
Cycle Q Clear(g_c), s	6.7	16.4	16.4	7.0	18.1	18.1	8.3	6.4	6.7	8.3	3.7	6.6
Prop In Lane	1.00		0.15	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	762	782	139	775	792	257	175	149	258	147	132
V/C Ratio(X)	0.80	0.48	0.48	0.81	0.51	0.52	0.58	0.65	0.67	0.58	0.42	0.74
Avail Cap(c_a), veh/h	199	762	782	223	775	792	272	224	190	258	182	163
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.9	21.9	21.9	49.8	22.2	22.2	41.0	48.2	48.3	41.7	47.9	49.3
Incr Delay (d2), s/veh	14.2	0.5	0.5	10.6	2.4	2.4	2.7	4.1	6.1	3.2	1.9	13.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.0	12.5	12.8	6.8	14.3	14.5	7.6	6.3	5.7	7.7	3.4	6.1
LnGrp Delay(d),s/veh	64.1	22.4	22.4	60.4	24.6	24.6	43.7	52.3	54.4	44.9	49.8	62.5
LnGrp LOS	E	C	C	E	C	C	D	D	D	D	D	E
Approach Vol, veh/h		851			919			361			309	
Approach Delay, s/veh		27.9			29.0			49.3			51.5	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	56.5	18.0	19.1	16.7	56.2	19.1	18.0
Change Period (Y+Rc), s	7.9	7.9	* 8.7	* 8.9	7.9	7.9	* 8.9	* 8.9
Max Green Setting (Gmax), s	12.1	42.1	* 9.3	* 13	14.1	40.1	* 11	* 11
Max Q Clear Time (g_c+I1), s	8.7	20.1	10.3	8.7	9.0	18.4	10.3	8.6
Green Ext Time (p_c), s	0.1	10.7	0.0	0.8	0.1	10.6	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	34.4
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	2.6	0.2	0.2	2.8	0.2	0.2	0.2	0.3	0.3	3.7	0.1	0.2
Total Del/Veh (s)	48.7	28.1	16.6	49.6	28.4	17.6	29.8	62.4	45.8	34.4	44.5	14.5
Total Stops	97	448	32	99	475	40	100	96	154	115	50	73
Travel Time (hr)	2.4	10.5	0.6	2.2	9.6	0.7	1.7	2.3	3.0	2.2	1.1	0.9
Fuel Used (gal)	1.0	5.5	0.4	0.9	4.6	0.4	0.8	0.8	1.2	0.9	0.4	0.5

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	32.7
Total Stops	1779
Travel Time (hr)	37.3
Fuel Used (gal)	17.3

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	34.9
Total Stops	1779
Travel Time (hr)	56.1
Fuel Used (gal)	36.6

Intersection: 3: Seminole Woods Blvd & SR 100

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	T	TR
Maximum Queue (ft)	157	261	249	181	336	281	152	321	164	96	131
Average Queue (ft)	60	161	146	78	193	168	68	180	69	33	50
95th Queue (ft)	117	240	229	153	288	256	127	299	133	75	100
Link Distance (ft)		1171	1171		865	865	669	669		831	831
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	400			550					450		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:57	6:57	6:57	6:57	6:57	6:57
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2419	2479	2385	2362	2263	2380
Vehs Exited	2429	2474	2374	2334	2235	2369
Starting Vehs	54	38	41	38	45	41
Ending Vehs	44	43	52	66	73	57
Travel Distance (mi)	932	952	914	901	868	913
Travel Time (hr)	53.9	55.7	53.8	52.5	49.6	53.1
Total Delay (hr)	21.1	22.1	21.8	20.7	19.1	21.0
Total Stops	1757	1752	1713	1695	1631	1708
Fuel Used (gal)	36.4	37.6	36.1	35.4	33.9	35.9

Interval #0 Information Seeding

Start Time	6:57
End Time	7:00
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2419	2479	2385	2362	2263	2380
Vehs Exited	2429	2474	2374	2334	2235	2369
Starting Vehs	54	38	41	38	45	41
Ending Vehs	44	43	52	66	73	57
Travel Distance (mi)	932	952	914	901	868	913
Travel Time (hr)	53.9	55.7	53.8	52.5	49.6	53.1
Total Delay (hr)	21.1	22.1	21.8	20.7	19.1	21.0
Total Stops	1757	1752	1713	1695	1631	1708
Fuel Used (gal)	36.4	37.6	36.1	35.4	33.9	35.9

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	2.6	0.2	0.2	2.7	0.2	0.3	3.4	0.5	0.2	3.7	0.1	0.2
Total Del/Veh (s)	46.5	26.5	14.9	45.8	26.6	17.4	31.3	47.0	8.7	35.3	44.0	12.6
Total Stops	97	416	28	96	448	38	106	91	135	123	49	81
Travel Time (hr)	2.3	10.0	0.6	2.1	9.2	0.7	2.0	1.9	1.2	2.4	1.1	0.9
Fuel Used (gal)	1.0	5.3	0.4	0.8	4.5	0.4	0.9	0.8	0.7	1.1	0.4	0.5

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	28.2
Total Stops	1708
Travel Time (hr)	34.4
Fuel Used (gal)	16.7

Total Network Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	30.3
Total Stops	1708
Travel Time (hr)	53.1
Fuel Used (gal)	35.9

Intersection: 3: Seminole Woods Blvd & SR 100

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	T	TR
Maximum Queue (ft)	133	260	250	145	304	281	138	141	111	191	87	128
Average Queue (ft)	59	149	133	65	170	142	65	70	49	77	32	49
95th Queue (ft)	118	234	221	126	262	235	123	125	88	145	68	93
Link Distance (ft)		1171	1171		852	852		664	664		831	831
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			550			250			450		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	86	786	106	159	845	74	97	53	108	103	67	102
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1863	1900	1881	1861	1900	1863	1875	1900	1845	1900	1900
Adj Flow Rate, veh/h	93	854	108	173	918	77	105	58	43	112	73	33
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	2	2	1	2	2	2	0	0	3	0	0
Cap, veh/h	117	1452	184	202	1674	140	245	77	57	214	196	84
Arrive On Green	0.07	0.46	0.46	0.11	0.51	0.51	0.07	0.08	0.08	0.07	0.08	0.08
Sat Flow, veh/h	1792	3162	400	1792	3304	277	1774	1001	742	1757	2467	1052
Grp Volume(v), veh/h	93	478	484	173	491	504	105	0	101	112	52	54
Grp Sat Flow(s),veh/h/ln	1792	1770	1792	1792	1768	1812	1774	0	1744	1757	1805	1714
Q Serve(g_s), s	6.1	24.0	24.0	11.4	22.8	22.8	6.5	0.0	6.8	6.9	3.3	3.6
Cycle Q Clear(g_c), s	6.1	24.0	24.0	11.4	22.8	22.8	6.5	0.0	6.8	6.9	3.3	3.6
Prop In Lane	1.00		0.22	1.00		0.15	1.00		0.43	1.00		0.61
Lane Grp Cap(c), veh/h	117	813	823	202	896	918	245	0	133	214	143	136
V/C Ratio(X)	0.80	0.59	0.59	0.86	0.55	0.55	0.43	0.00	0.76	0.52	0.36	0.40
Avail Cap(c_a), veh/h	181	813	823	270	896	918	288	0	190	251	200	190
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.3	24.0	24.0	52.3	20.2	20.2	46.6	0.0	54.3	46.5	52.4	52.5
Incr Delay (d2), s/veh	12.6	3.1	3.1	18.2	2.4	2.4	1.2	0.0	10.1	2.0	1.5	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.2	18.2	18.3	10.9	17.3	17.6	5.8	0.0	6.6	6.3	3.1	3.2
LnGrp Delay(d),s/veh	67.9	27.1	27.1	70.5	22.6	22.6	47.8	0.0	64.4	48.5	53.9	54.4
LnGrp LOS	E	C	C	E	C	C	D		E	D	D	D
Approach Vol, veh/h		1055			1168			206			218	
Approach Delay, s/veh		30.7			29.7			56.0			51.3	
Approach LOS		C			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.7	68.7	17.5	18.1	21.4	63.0	17.1	18.4
Change Period (Y+Rc), s	7.9	7.9	* 8.7	* 8.9	7.9	7.9	* 8.9	* 8.9
Max Green Setting (Gmax), s	12.1	50.1	* 11	* 13	18.1	44.1	* 11	* 13
Max Q Clear Time (g_c+I1), s	8.1	24.8	8.9	8.8	13.4	26.0	8.5	5.6
Green Ext Time (p_c), s	0.1	12.9	0.1	0.4	0.2	10.7	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	33.9
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	2:57	2:57	2:57	2:57	2:57	2:57
End Time	4:00	4:00	4:00	4:00	4:00	4:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2577	2708	2594	2565	2525	2594
Vehs Exited	2578	2676	2612	2562	2524	2590
Starting Vehs	48	30	72	50	56	51
Ending Vehs	47	62	54	53	57	53
Travel Distance (mi)	1001	1046	1013	996	984	1008
Travel Time (hr)	58.5	61.1	57.8	58.0	56.7	58.4
Total Delay (hr)	23.4	24.4	22.4	23.1	22.3	23.1
Total Stops	1759	1847	1723	1769	1676	1756
Fuel Used (gal)	39.0	41.0	39.0	38.6	37.7	39.1

Interval #0 Information Seeding

Start Time	2:57
End Time	3:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:00
End Time	4:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2577	2708	2594	2565	2525	2594
Vehs Exited	2578	2676	2612	2562	2524	2590
Starting Vehs	48	30	72	50	56	51
Ending Vehs	47	62	54	53	57	53
Travel Distance (mi)	1001	1046	1013	996	984	1008
Travel Time (hr)	58.5	61.1	57.8	58.0	56.7	58.4
Total Delay (hr)	23.4	24.4	22.4	23.1	22.3	23.1
Total Stops	1759	1847	1723	1769	1676	1756
Fuel Used (gal)	39.0	41.0	39.0	38.6	37.7	39.1

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.3	6.0	0.5	2.1	5.3	0.3	1.0	0.9	1.0	1.2	1.0	0.4
Total Stops	73	492	62	134	476	39	81	46	108	94	62	89
Travel Time (hr)	2.0	12.1	1.5	3.1	10.1	0.8	1.5	1.1	1.6	1.9	1.4	1.0
Fuel Used (gal)	0.8	6.3	0.8	1.2	5.2	0.4	0.6	0.4	0.7	0.8	0.6	0.6

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	All
Denied Delay (hr)	0.4
Total Delay (hr)	20.9
Total Stops	1756
Travel Time (hr)	38.1
Fuel Used (gal)	18.4

Total Network Performance

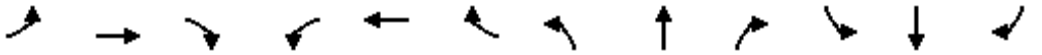
Denied Delay (hr)	0.4
Total Delay (hr)	22.7
Total Stops	1756
Travel Time (hr)	58.4
Fuel Used (gal)	39.1

Intersection: 3: Seminole Woods Blvd & SR 100

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	T	TR
Maximum Queue (ft)	116	316	298	190	302	290	149	227	146	92	139
Average Queue (ft)	48	182	171	99	187	169	68	111	74	42	55
95th Queue (ft)	98	277	264	172	282	273	126	208	129	78	105
Link Distance (ft)		1171	1171		865	865	669	669		831	831
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	400			550					450		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Network Summary

Network wide Queuing Penalty: 0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	86	786	106	159	845	74	97	53	108	103	67	102
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1863	1900	1881	1861	1900	1863	1900	1863	1845	1900	1900
Adj Flow Rate, veh/h	93	854	108	173	918	77	105	58	43	112	73	33
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	2	2	1	2	2	2	0	2	3	0	0
Cap, veh/h	117	1482	187	202	1704	143	233	127	106	237	172	73
Arrive On Green	0.07	0.47	0.47	0.11	0.52	0.52	0.07	0.07	0.07	0.07	0.07	0.07
Sat Flow, veh/h	1792	3162	400	1792	3304	277	1774	1900	1583	1757	2467	1052
Grp Volume(v), veh/h	93	478	484	173	491	504	105	58	43	112	52	54
Grp Sat Flow(s),veh/h/ln	1792	1770	1792	1792	1768	1812	1774	1900	1583	1757	1805	1714
Q Serve(g_s), s	6.1	23.6	23.6	11.4	22.4	22.4	6.5	3.5	3.1	7.0	3.3	3.6
Cycle Q Clear(g_c), s	6.1	23.6	23.6	11.4	22.4	22.4	6.5	3.5	3.1	7.0	3.3	3.6
Prop In Lane	1.00		0.22	1.00		0.15	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	117	829	840	202	912	935	233	127	106	237	126	119
V/C Ratio(X)	0.80	0.58	0.58	0.86	0.54	0.54	0.45	0.46	0.41	0.47	0.42	0.45
Avail Cap(c_a), veh/h	181	829	840	270	912	935	275	207	173	273	200	190
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.3	23.2	23.2	52.3	19.5	19.5	47.7	53.9	53.7	47.4	53.5	53.6
Incr Delay (d2), s/veh	12.6	2.9	2.9	18.3	2.3	2.2	1.4	2.6	2.5	1.5	2.2	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.2	18.0	18.1	10.9	17.1	17.4	5.9	3.5	2.6	6.3	3.1	3.3
LnGrp Delay(d),s/veh	67.9	26.1	26.1	70.6	21.7	21.7	49.0	56.5	56.2	48.9	55.7	56.3
LnGrp LOS	E	C	C	E	C	C	D	E	E	D	E	E
Approach Vol, veh/h		1055			1168			206			218	
Approach Delay, s/veh		29.8			29.0			52.6			52.3	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.7	69.8	17.6	16.9	21.4	64.1	17.2	17.2
Change Period (Y+Rc), s	7.9	7.9	* 8.7	* 8.9	7.9	7.9	* 8.9	* 8.9
Max Green Setting (Gmax), s	12.1	50.1	* 11	* 13	18.1	44.1	* 11	* 13
Max Q Clear Time (g_c+I1), s	8.1	24.4	9.0	5.5	13.4	25.6	8.5	5.6
Green Ext Time (p_c), s	0.1	12.8	0.1	0.5	0.2	10.7	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	33.1
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	2:57	2:57	2:57	2:57	2:57	2:57
End Time	4:00	4:00	4:00	4:00	4:00	4:00
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2495	2670	2598	2537	2597	2578
Vehs Exited	2512	2660	2590	2525	2599	2577
Starting Vehs	52	36	35	38	51	42
Ending Vehs	35	46	43	50	49	44
Travel Distance (mi)	972	1036	1006	988	1011	1003
Travel Time (hr)	51.0	54.1	53.8	50.2	52.2	52.3
Total Delay (hr)	22.5	23.6	24.3	21.4	22.5	22.9
Total Stops	1605	1653	1681	1507	1588	1606
Fuel Used (gal)	36.4	38.5	37.6	36.3	37.3	37.2

Interval #0 Information Seeding

Start Time	2:57
End Time	3:00
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:00
End Time	4:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2495	2670	2598	2537	2597	2578
Vehs Exited	2512	2660	2590	2525	2599	2577
Starting Vehs	52	36	35	38	51	42
Ending Vehs	35	46	43	50	49	44
Travel Distance (mi)	972	1036	1006	988	1011	1003
Travel Time (hr)	51.0	54.1	53.8	50.2	52.2	52.3
Total Delay (hr)	22.5	23.6	24.3	21.4	22.5	22.9
Total Stops	1605	1653	1681	1507	1588	1606
Fuel Used (gal)	36.4	38.5	37.6	36.3	37.3	37.2

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.2	6.0	0.4	2.4	5.6	0.3	1.2	0.7	0.3	1.2	1.0	0.5
Total Stops	71	419	54	143	420	33	83	42	99	93	59	90
Travel Time (hr)	1.8	9.4	1.1	3.3	8.3	0.6	1.6	0.8	0.7	2.0	1.4	1.2
Fuel Used (gal)	0.8	5.6	0.7	1.4	4.8	0.4	0.8	0.3	0.5	0.8	0.5	0.6

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	All
Denied Delay (hr)	0.5
Total Delay (hr)	20.8
Total Stops	1606
Travel Time (hr)	32.2
Fuel Used (gal)	17.3

Total Network Performance

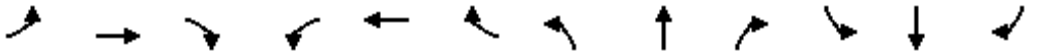
Denied Delay (hr)	0.5
Total Delay (hr)	22.4
Total Stops	1606
Travel Time (hr)	52.3
Fuel Used (gal)	37.2

Intersection: 3: Seminole Woods Blvd & SR 100

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	T	TR
Maximum Queue (ft)	125	312	295	216	283	261	148	103	89	169	98	140
Average Queue (ft)	45	163	135	102	159	137	66	37	38	76	40	59
95th Queue (ft)	94	261	242	183	255	234	126	78	75	141	82	111
Link Distance (ft)		1171	1171		852	852		664	664		831	831
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			550			250			450		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	84	774	162	184	946	90	118	45	97	85	60	104
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1854	1900	1900	1866	1900	1863	1876	1900	1900	1900	1900
Adj Flow Rate, veh/h	88	806	164	192	985	88	123	47	50	89	62	36
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	3	3	0	2	2	2	4	4	0	0	0
Cap, veh/h	110	1318	268	221	1680	150	250	74	78	212	151	81
Arrive On Green	0.06	0.45	0.45	0.12	0.51	0.51	0.08	0.09	0.09	0.06	0.07	0.07
Sat Flow, veh/h	1723	2917	594	1810	3293	294	1774	833	886	1810	2268	1221
Grp Volume(v), veh/h	88	487	483	192	530	543	123	0	97	89	48	50
Grp Sat Flow(s),veh/h/ln	1723	1761	1749	1810	1773	1814	1774	0	1720	1810	1805	1685
Q Serve(g_s), s	6.0	25.1	25.1	12.5	25.1	25.1	7.6	0.0	6.5	5.4	3.1	3.4
Cycle Q Clear(g_c), s	6.0	25.1	25.1	12.5	25.1	25.1	7.6	0.0	6.5	5.4	3.1	3.4
Prop In Lane	1.00		0.34	1.00		0.16	1.00		0.52	1.00		0.72
Lane Grp Cap(c), veh/h	110	796	791	221	904	925	250	0	152	212	120	112
V/C Ratio(X)	0.80	0.61	0.61	0.87	0.59	0.59	0.49	0.00	0.64	0.42	0.40	0.44
Avail Cap(c_a), veh/h	174	796	791	273	904	925	274	0	188	275	200	187
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.4	24.9	24.9	51.7	20.5	20.5	47.1	0.0	52.8	48.3	53.7	53.9
Incr Delay (d2), s/veh	12.8	3.5	3.5	21.3	2.8	2.7	1.5	0.0	4.9	1.3	2.2	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.9	18.8	18.7	12.0	18.8	19.2	6.9	0.0	5.9	5.0	2.9	3.0
LnGrp Delay(d),s/veh	68.2	28.4	28.4	73.0	23.3	23.3	48.6	0.0	57.7	49.6	55.9	56.6
LnGrp LOS	E	C	C	E	C	C	D		E	D	E	E
Approach Vol, veh/h		1058			1265			220			187	
Approach Delay, s/veh		31.7			30.8			52.6			53.1	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	69.1	15.8	19.5	22.6	62.1	18.4	16.9
Change Period (Y+Rc), s	7.9	7.9	* 8.7	* 8.9	7.9	7.9	* 8.9	* 8.9
Max Green Setting (Gmax), s	12.1	50.1	* 11	* 13	18.1	44.1	* 11	* 13
Max Q Clear Time (g_c+I1), s	8.0	27.1	7.4	8.5	14.5	27.1	9.6	5.4
Green Ext Time (p_c), s	0.1	15.0	0.1	0.4	0.2	12.1	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	34.5
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:27	4:27	4:27	4:27	4:27	4:27
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2723	2865	2700	2659	2685	2726
Vehs Exited	2694	2859	2708	2641	2695	2719
Starting Vehs	45	45	59	43	55	48
Ending Vehs	74	51	51	61	45	56
Travel Distance (mi)	1062	1114	1053	1034	1051	1063
Travel Time (hr)	61.6	65.6	60.8	60.2	61.7	62.0
Total Delay (hr)	24.4	26.4	23.8	24.0	24.9	24.7
Total Stops	1838	1963	1811	1779	1830	1843
Fuel Used (gal)	41.3	43.6	40.6	40.0	40.6	41.3

Interval #0 Information Seeding

Start Time	4:27
End Time	4:30
Total Time (min)	3

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2723	2865	2700	2659	2685	2726
Vehs Exited	2694	2859	2708	2641	2695	2719
Starting Vehs	45	45	59	43	55	48
Ending Vehs	74	51	51	61	45	56
Travel Distance (mi)	1062	1114	1053	1034	1051	1063
Travel Time (hr)	61.6	65.6	60.8	60.2	61.7	62.0
Total Delay (hr)	24.4	26.4	23.8	24.0	24.9	24.7
Total Stops	1838	1963	1811	1779	1830	1843
Fuel Used (gal)	41.3	43.6	40.6	40.0	40.6	41.3

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.3	6.4	0.9	2.6	5.9	0.4	1.3	0.7	0.6	1.0	0.8	0.5
Total Stops	79	499	100	161	516	50	96	40	83	74	51	94
Travel Time (hr)	2.0	12.4	2.3	3.8	11.2	1.0	1.9	0.9	1.1	1.6	1.1	1.1
Fuel Used (gal)	0.8	6.3	1.2	1.5	5.8	0.5	0.8	0.3	0.5	0.7	0.4	0.6

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	All
Denied Delay (hr)	0.4
Total Delay (hr)	22.4
Total Stops	1843
Travel Time (hr)	40.5
Fuel Used (gal)	19.4

Total Network Performance

Denied Delay (hr)	0.4
Total Delay (hr)	24.3
Total Stops	1843
Travel Time (hr)	62.0
Fuel Used (gal)	41.3

Intersection: 3: Seminole Woods Blvd & SR 100

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	T	TR
Maximum Queue (ft)	132	362	348	223	320	308	150	179	136	82	128
Average Queue (ft)	52	190	188	117	204	183	79	86	55	35	56
95th Queue (ft)	105	305	310	191	301	291	136	154	108	71	103
Link Distance (ft)		1171	1171		865	865	669	669		831	831
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	400			550					450		
Storage Blk Time (%)		0									
Queuing Penalty (veh)		0									

Network Summary

Network wide Queuing Penalty: 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	84	774	162	184	946	90	118	45	97	85	60	104
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1854	1900	1900	1866	1900	1863	1827	1900	1900	1900	1900
Adj Flow Rate, veh/h	88	806	164	192	985	88	123	47	50	89	62	36
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	3	3	0	2	2	2	4	0	0	0	0
Cap, veh/h	110	1318	268	221	1680	150	250	162	143	252	151	81
Arrive On Green	0.06	0.45	0.45	0.12	0.51	0.51	0.08	0.09	0.09	0.06	0.07	0.07
Sat Flow, veh/h	1723	2917	594	1810	3293	294	1774	1827	1615	1810	2268	1221
Grp Volume(v), veh/h	88	487	483	192	530	543	123	47	50	89	48	50
Grp Sat Flow(s),veh/h/ln	1723	1761	1749	1810	1773	1814	1774	1827	1615	1810	1805	1685
Q Serve(g_s), s	6.0	25.1	25.1	12.5	25.1	25.1	7.6	2.9	3.5	5.4	3.1	3.4
Cycle Q Clear(g_c), s	6.0	25.1	25.1	12.5	25.1	25.1	7.6	2.9	3.5	5.4	3.1	3.4
Prop In Lane	1.00		0.34	1.00		0.16	1.00		1.00	1.00		0.72
Lane Grp Cap(c), veh/h	110	796	791	221	904	925	250	162	143	252	120	112
V/C Ratio(X)	0.80	0.61	0.61	0.87	0.59	0.59	0.49	0.29	0.35	0.35	0.40	0.44
Avail Cap(c_a), veh/h	174	796	791	273	904	925	274	199	176	315	200	187
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.4	24.9	24.9	51.7	20.5	20.5	47.1	51.2	51.4	48.2	53.7	53.9
Incr Delay (d2), s/veh	12.8	3.5	3.5	21.3	2.8	2.7	1.5	1.0	1.5	0.8	2.2	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.9	18.8	18.7	12.0	18.8	19.2	6.9	2.7	2.9	5.0	2.9	3.0
LnGrp Delay(d),s/veh	68.2	28.4	28.4	73.0	23.3	23.3	48.6	52.2	52.9	49.1	55.9	56.6
LnGrp LOS	E	C	C	E	C	C	D	D	D	D	E	E
Approach Vol, veh/h		1058			1265			220			187	
Approach Delay, s/veh		31.7			30.8			50.3			52.8	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	69.1	15.8	19.5	22.6	62.1	18.4	16.9
Change Period (Y+Rc), s	7.9	7.9	* 8.7	* 8.9	7.9	7.9	* 8.9	* 8.9
Max Green Setting (Gmax), s	12.1	50.1	* 11	* 13	18.1	44.1	* 11	* 13
Max Q Clear Time (g_c+I1), s	8.0	27.1	7.4	5.5	14.5	27.1	9.6	5.4
Green Ext Time (p_c), s	0.1	15.0	0.1	0.5	0.2	12.1	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	34.3
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Summary of All Intervals

Run Number	1	3	4	5	6	Avg
Start Time	4:27	4:27	4:27	4:27	4:27	4:27
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	63	63	63	63	63	63
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2752	2651	2694	2658	2724	2695
Vehs Exited	2721	2660	2692	2657	2707	2688
Starting Vehs	44	58	42	55	58	51
Ending Vehs	75	49	44	56	75	60
Travel Distance (mi)	1070	1035	1048	1037	1056	1049
Travel Time (hr)	62.4	58.9	60.3	61.2	62.5	61.0
Total Delay (hr)	24.9	22.6	23.6	24.8	25.4	24.2
Total Stops	1883	1769	1794	1838	1893	1837
Fuel Used (gal)	41.8	39.6	40.3	40.2	41.1	40.6

Interval #0 Information Seeding

Start Time	4:27
End Time	4:30
Total Time (min)	3

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	3	4	5	6	Avg
Vehs Entered	2752	2651	2694	2658	2724	2695
Vehs Exited	2721	2660	2692	2657	2707	2688
Starting Vehs	44	58	42	55	58	51
Ending Vehs	75	49	44	56	75	60
Travel Distance (mi)	1070	1035	1048	1037	1056	1049
Travel Time (hr)	62.4	58.9	60.3	61.2	62.5	61.0
Total Delay (hr)	24.9	22.6	23.6	24.8	25.4	24.2
Total Stops	1883	1769	1794	1838	1893	1837
Fuel Used (gal)	41.8	39.6	40.3	40.2	41.1	40.6

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.2	6.2	0.9	2.7	5.9	0.4	1.4	0.6	0.2	0.9	0.9	0.4
Total Stops	75	482	98	166	524	51	107	39	80	72	57	86
Travel Time (hr)	1.9	12.1	2.2	3.9	11.2	1.0	2.1	0.8	0.7	1.5	1.2	1.0
Fuel Used (gal)	0.8	6.2	1.1	1.5	5.7	0.5	0.8	0.3	0.4	0.7	0.5	0.6

3: Seminole Woods Blvd & SR 100 Performance by movement

Movement	All
Denied Delay (hr)	0.5
Total Delay (hr)	21.8
Total Stops	1837
Travel Time (hr)	39.7
Fuel Used (gal)	19.0

Total Network Performance

Denied Delay (hr)	0.5
Total Delay (hr)	23.7
Total Stops	1837
Travel Time (hr)	61.0
Fuel Used (gal)	40.6

Intersection: 3: Seminole Woods Blvd & SR 100

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	T	TR
Maximum Queue (ft)	140	347	339	239	326	324	156	118	78	124	91	127
Average Queue (ft)	50	188	184	112	195	180	82	40	35	55	39	53
95th Queue (ft)	104	298	303	200	295	285	140	89	64	103	77	105
Link Distance (ft)		1171	1171		852	852		664	664		831	831
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			550			250			450		
Storage Blk Time (%)		0										
Queuing Penalty (veh)		0										

Network Summary

Network wide Queuing Penalty: 0

APPENDIX C: Cost Estimate

COST ESTIMATE: SR 100 AT SEMINOLE WOODS PKWY

						INFLATION ADJUSTED COSTS		
PAY ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**COST PER UNIT***	**TOTAL**	**2016**	**2017**	**2018**
101-1	MOBILIZATION	LS	1	$5,000.00	$5,000.00	$5,135.00	$5,263.38	$5,394.96
102-1	MAINTENANCE OF TRAFFIC	LS	1	$5,000.00	$5,000.00	$5,135.00	$5,263.38	$5,394.96
110-1-1	CLEARING & GRUBBING	AC	0.147	$3,012.93	$442.90	$454.86	$466.23	$477.89
160-4	TYPE B STABILIZATION	SY	711	$9.35	$6,647.85	$6,827.34	$6,998.03	$7,172.98
	LIMEROCK-NEW MATERIAL	CY	237	$33.00	$7,821.00	$8,032.17	$8,232.97	$8,438.80
334-1-33	SUPERPAVE ASPHALTIC CONCRETE	TN	16	$93.53	$1,496.48	$1,536.88	$1,575.31	$1,614.69
337-7-43	ASPHALTIC CONCRETE FRICTION COURSE, FC-12.5	TN	8	$96.93	$775.44	$796.38	$816.29	$836.69
630-2-12	CONDUIT, F&I, OPEN TRENCH	LF	20	$16.16	$323.20	$331.93	$340.22	$348.73
650-1-311	TRAFFIC SIGNAL, F&I, 3 SECT, 1 WAY, ALUMINUM	AS	2	$954.45	$1,908.90	$1,960.44	$2,009.45	$2,059.69
650-1-411	TRAFFIC SIGNAL, F&I, 4 SECT, 1 WAY, ALUMINUM	AS	2	$1,155.76	$2,311.52	$2,373.93	$2,433.28	$2,494.11
650-2-102	VEHICULAR SIGNAL AUXILIARIES, F&I, BACKPLATE WITH REFLECTIVE BORDER	EA	12	$233.56	$2,802.72	$2,878.39	$2,950.35	$3,024.11
660-1-101	LOOP DETECTOR INDUCTIVE, F&I	EA	1	$245.00	$245.00	$251.62	$257.91	$264.35
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	AS	1	$617.61	$617.61	$634.29	$650.14	$666.40
690-10	SIGNAL HEAD TRAFFIC ASSEMBLY REMOVAL	EA	2	$54.53	$109.06	$112.00	$114.80	$117.67
700-1-11	SINGLE POST SIGN, GROUND MOUNT, <12 SF, F&I	AS	2	$327.96	$655.92	$673.63	$690.47	$707.73
700-1-50	SINGLE POST SIGN, GROUND MOUNT, <12 SF, RELOCATE	AS	1	$177.83	$177.83	$182.63	$187.20	$191.88
*	PAINTED MARKINGS, STANDARD, WHITE, SOLID 6"	NM	0.123	$921.04	$113.29	$116.35	$119.26	$122.24
*	PAINTED MARKINGS, STANDARD, WHITE, SOLID 24"	LF	12	$1.37	$16.44	$16.88	$17.31	$17.74
*	PAINTED MARKINGS, STANDARD, WHITE, SKIP 6"	GM	0.055	$398.55	$21.92	$22.51	$23.07	$23.65
*	PAINTED MARKINGS, STANDARD, WHITE, ARROW	EA	8	$23.01	$184.08	$189.05	$193.78	$198.62
*	PAINTED MARKINGS, STANDARD, WHITE, MESSAGES	EA	4	$37.36	$149.44	$153.47	$157.31	$161.24
*	PAINTED MARKINGS, STANDARD, YELLOW, SOLID 6"	NM	0.076	$926.61	$70.42	$72.32	$74.13	$75.99
711-17	THERMOPLASTIC PAVEMENT MARKINGS, REMOVE	SF	92	$2.19	$201.48	$206.92	$212.09	$217.40
*Unit costs were provided in the Florida Department of Transporatation Item Average Unit Cost from 01/01/2013 to 12/31/2013				TOTAL:	$37,092.50	$38,094.00	$39,046.35	$40,022.51
				ENGINEERING DESIGN COST (10%):	$3,709.25	$3,809.40	$3,904.63	$4,002.25
				CONTINGENCY (15%):	$5,563.88	$5,714.10	$5,856.95	$6,003.38
				GRAND TOTAL:	**$46,365.63**	**$47,617.50**	**$48,807.94**	**$50,028.13**